DOCUMENT RESUME

ED 041 626 PS 003 274

TITLE	Evaluation Report: Early Childhood Education Program, 1969 Field Test.
INSTITUTION	Appalachia Educational Lab., Charleston, W. Va.
PUB DATE	Mar 70
NOTE	204p.
EDRS PRICE	EDRS Price MF-$1.00 HC-$10.30
DESCRIPTORS	Cognitive Development, Cost Effectiveness, *Early Childhood Education, Educational Objectives, Evaluation Techniques, Home Programs, Language Development, Mobile Classrooms, Paraprofessional School Personnel, Parent Participation, Parent Reaction, *Pilot Projects, *Preschool Programs, *Program Evaluation, Student Attitudes, Televised Instruction
IDENTIFIERS	Appalachia Educational Laboratory, Appalachian Preschool Test of Cognitive Skills, ITPA, PPVT

ABSTRACT

Reported are findings from the first year's field test of the home-oriented Appalachia Educational Laboratory (AEL) Early Childhood Education Program for 3-, 4-, and 5-year-olds. The program consists of a 30-minute daily television lesson, a weekly home visit by a paraprofessional, and group instruction once a week in a mobile classroom. The sample was made up of a total of 450 children divided into three groups. Group 1 received TV instruction and home visits and attended the mobile classroom. Group 2 had TV and home visits; Group 3, only TV instruction. 30 subjects from each group were tested for evaluation purposes. The data are presented in 5 categories: program effort, program performance, program pervasiveness, program cost analysis, and evaluation synthesis. Appendixes (one-sixth of this report) present detailed data analysis for (1) the program's evaluation plan, (2) interest level of project children, (3) IQ gain, (4) language development and behavior, (5) cognitive growth, (6) the parent attitude questionnaire and checklist, (7) paraprofessional attitude data instrument and results, and (8) socioeconomic factors of treatment and control groups. It was found that TV lessons and home visitations (but not the mobile classroom) had a positive effect on children's cognitive development. Children in Group 1 scored highest on verbal expression. (DR)

EVALUATION REPORT: EARLY CHILDHOOD EDUCATION PROGRAM

1969 FIELD TEST

Appalachia Educational Laboratory
Charleston, West Virginia

March, 1970

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Foreword

This evaluation report is written primarily for individuals in management positions. Accordingly, the report is organized around the questions that guided the evaluation, followed by concluding statements obtained from more detailed data analyses. Individuals interested in the detailed analyses will find them located in the appendices.

This report supersedes a preliminary report written by H. Kent Moore dated September, 1969. A number of individuals have provided invaluable inputs to the report, but special recognition should be given to Dr. Ray Norris from George Peabody College, Dr. Frank Hooper from West Virginia University, and Dr. John Kennedy from The Ohio State University for their assistance in the data analyses. Dr. Benjamin Carmichael and Dr. William Bost from the Appalachia Educational Laboratory contributed significantly to the final editing.

This is the first report based on an evaluation system designed especially for educational development at the Appalachia Educational Laboratory. This system incorporates some of the concepts of the CIPP model developed by Dr. Daniel Stufflebeam at The Ohio State University and some of those developed by Dr. Michael Scriven at Indiana University.

James T. Ranson

EVALUATION REPORT: EARLY CHILDHOOD EDUCATION PROGRAM
1969 FIELD TEST

Introduction

This is a technical report of the findings from the first year's field test of the AEL Early Childhood Education Program. An evaluation plan (see Appendix A) specifies the questions that were asked to secure the type of information that was considered important. This report follows the organization of the questions as they are listed in Section I, B, of the plan.

The Program

The Early Childhood Education Program is home-oriented and is designed for 3-, 4-, and 5-year-old children. It consists of a 30-minute daily television lesson received in the home; a weekly home visit by paraprofessionals to counsel with parents and deliver materials used by parents and children, and group instruction provided once each week in a mobile classroom taken near the home for convenience to parents and small children.

The program is based on behavioral objectives developed by West Virginia University derived from a nationwide study of preschool education programs and an assessment of 3-, 4-, and 5-year-old Appalachian children. A materials development team is employed to translate those objectives into television lessons, materials for use by parents and children, and materials and exercises for use in group instruction in the mobile classroom.

The lessons, recorded on video tape, are produced in Charleston, West Virginia, using the facilities of a commercial studio. They are sent to Oak Hill, West Virginia, where they are broadcast by a commercial television station over an eight-county area of southern West Virginia. The home visitation and mobile classroom components of the program operate out of Beckley, West Virginia. Eight paraprofessionals were employed and trained to perform home

visitation services, and one certified preschool teacher and an aide were employed to operate and furnish mobile classroom instruction. The fully equipped 8' x 22' classroom is mounted on a two and one-half ton truck chassis. Power for the operation of the heating and cooling system and all electronic equipment in the classroom is provided through meters mounted on poles at each scheduled stop of the classroom. The mobile classroom was used for only four months of the 1969 field test. An office is maintained in Beckley as headquarters for the field personnel.

The Sample

A total of 450 children was selected from the viewing area as the target audience for the program. This sample was categorized into three groups. The first group of 150 children--ten subgroups of 15 each--received TV instruction, home visits, and attended the mobile classroom. The second group of 150 received TV instruction and home visits, and the third group of 150 received only TV instruction.

For evaluation purposes, 30 individuals per group for a total of 90 subjects were selected for testing purposes, and an additional 24 subjects in southwest Virginia were selected for a control group.

Nature of the Data

The data for this report were collected in the first year of a scheduled three-year field test of the Appalachia Educational Laboratory Early Childhood Education Program. The field test period closely approximates a regular school year, September through May.

There was wide variability in the availability and quality of data for each item. Responses to each question were interpreted accordingly. The availability and quality of data were categorized as follows:

- Data not available or determinable.
- Data available but not collected.
- Data collected but not sufficient for conclusive answer.
- Data collected sufficient for a conclusive answer.

Responses to each question were keyed by one of these four categories. It was assumed that questions where data were not available or determinable at this time were not answerable and therefore must be abandoned or delayed.

Data were not gathered on questions where data were available but not collected for reasons of (1) program lags, (2) time pressures, (3) political considerations, (4) practical considerations, or (5) low priority status of an item in the evaluation during the first year.

On questions where insufficient data were available for a firm answer, more extensive data gathering during the second and third years of field testing should yield sufficient data for a conclusive answer.

On questions for which there is sufficient data available and collected to provide a conclusive answer, it is not anticipated that further data collection will be necessary.

Data are presented by five major categories: program effort, program performance, program pervasiveness, program cost analysis, and evaluation synthesis. Detailed data analyses are included in the appendices.

Program Effort

Program effort is defined theoretically as time, personnel, and money required to acquire, install, operate, and maintain the field test. Effort is expressed operationally in terms of days and dollars. Theoretical definitions provide the criteria for the questions; operational definitions represent the measurements for answers to the questions. Program effort was categorized by three major functions: (1) acquisition and installation of facilities and

equipment; (2) operational requirements for the field test; and (3) equipment and facility maintenance requirements. Questions included in the evaluation plan were grouped according to these categories.

Acquisition and Installation of Equipment and Facilities

Six questions in the evaluation plan deal with the acquisition and installation of equipment and facilities. Information pertaining to this category of effort is presented in Table I, page 5. As indicated in the Table, most equipment required for the television component of the program was rented. Studio time and office space for the materials team was available in a commercial studio in Charleston, West Virginia. Certain technical personnel were also included in the studio package. Office space for the field operation for mobile classroom personnel and home visitors was available in Beckley, West Virginia.

Parking spaces for the mobile classroom were secured from churches, schools, and community centers. Power companies installed ten 220-volt meters for operation of the mobile classroom. The coordinator of the field testing operations made arrangements for these facilities. Experience indicated that at least one year of lead time is needed for making these arrangements and preparing for the production of the television lessons. No major legal obstacles were encountered to prevent the installation of the field testing operation.

Special consultants were used in connection with acquisition and installation of some equipment. Some services were required to establish specifications for media requirements, and extensive services were required to develop specifications for the mobile classroom facility.

Operational Requirements

Seven questions in the evaluation plan were directed toward determining program effort expended to meet operational requirements. Those requirements

Table I

Acquisition and Installation of Equipment and Facilities

Program Component	Equipment and Facilities	Method of Acquisition
Television	Studio package: Two black and white cameras, lighting, film chain and requisite components for control room, sound and taping.	Rental
	Darkroom	Rental
	Four 16 mm cameras	Purchased
	Office and workroom space	Rental
	Transmitting station	Rental
Home Visitation	Field Office	Rented
	Automobiles	Personal cars
Mobile Classroom	Preschool classroom, 8' x 22', mounted on two and one-half ton International truck chassis. Classroom includes electric heating and air conditioning, carpeted floors, six listening stations, record player, 16 mm projector, overhead projector, projection screen, psychedelic lights, hot plate stove, refrigerator, restroom facilities, and storage cabinets.	Purchased
	Ten power supply meters	Contracted
	Parking locations	Donated
	Field Office	Rented

deal with personnel requirements and time expended by them, requirements from other participating agencies, personnel training requirements, and efforts expended to determine the consistency between TV lessons and other materials and the priorities assigned to the behavioral objectives established for the program. Data recorded on operational requirements are presented in Table II, page 7.

Six professional positions, a supporting production position, and one secretary were maintained for the production of TV lessons. Two professional positions, one to coordinate mobile classroom and home visitations and a mobile classroom teacher, were maintained to conduct the field testing activities. One paraprofessional served as a teacher aide in the mobile classroom, and eight paraprofessionals were used for home visitors. Time expended by all personnel and cooperating agencies participating in the field testing activities are shown in Table II.

Cooperating agencies furnished vital services for installing and conducting the field test. Local power companies installed power outlets. The West Virginia State Department of Education furnished funds to provide snacks for children in the mobile classroom. Local employment agencies assisted in recruiting and interviewing paraprofessionals. Local school systems assisted in identifying groups of students, and one school system furnished the mobile classroom teacher through contract to the Laboratory.

In addition to program personnel as reflected in Table II, one full-time coordinator of the program and a one-half time secretary was maintained in the central staff of the Laboratory. Those positions have been maintained throughout the development of the Early Childhood Education Program and devote time to all three program components.

Additional program effort expended in operation included the provision of three weeks of inservice training for paraprofessionals prior to the

Table II

Program Effort Expressed in Terms of Operational Requirements

Program Component	Classification	Requirements
Television	Personnel	Curriculum Materials Coordinator Program Manager On-Camera Teacher Two Research Teachers Artist-Photographer Production Assistant Secretary Consultants
	Professional Time	11,520 man hours
	Production Assistance	1,920 man hours
	Clerical Time	1,920 man hours
	Consultant Time	120 man hours
	Cooperating Agencies	Television Station TV Production Studio
Home Visitation	Personnel	Field Activity Coordinator* Eight Paraprofessionals Secretary* Consultants
	Professional Time	960 man hours
	Paraprofessional Time	12,800 man hours
	Clerical Time	960 man hours
	Consultant Time	136 man hours
	Cooperating Agencies	Local Employment Agency Local School Systems
Mobile Classroom	Personnel	Field Activity Coordinator* Mobile Classroom Teacher Mobile Classroom Aide Secretary*
	Professional Time	2,880 man hours
	Paraprofessional Time	1,600 man hours
	Clerical Time	960 man hours
	Cooperating Agencies	Power Companies State Department of Education Local Employment Agency Local School Systems

*Time divided one-half between Mobile Classroom and Home Visitation.

initiation of field activities. Two weeks were devoted to an introduction of curriculum materials and the third week to sensitivity training and interview techniques. One afternoon per week during the entire year was spent by members of the curriculum materials team with the home visitors as mutual inservice training for both groups. All time used for inservice training is accounted for in Table II.

Question 5 in the evaluation plan dealt with operational costs. These are omitted here but are presented in the Cost Analysis section of this report.

A final note on operational requirements: Although no systematic data were collected and analyzed on the subject, specific feedback devices did exist to achieve congruency of behavioral objectives, television lessons, and supporting instructional materials during the first year field test. Obviously, too, such monitoring techniques were valuable inputs in the process of assigning priorities to various objectives. A complete description of this monitoring-feedback activity is presented in Appalachia Pre-school Program: A Process, First Year Report.

Maintenance

Questions were included in the evaluation plan aimed at determining the effort required to maintain the equipment and facilities required for operation of the program. Equipment associated with the TV lesson production was maintained as a part of the lease with the TV studio where programs were produced and the station where the programs were transmitted. Minor equipment such as movie cameras were maintained by the curriculum materials team photographer.

Mobile classroom facility maintenance was covered by an agreement with the local dealer from which the equipment was purchased; terms specified that the equipment be made available to the dealer one afternoon per week for the

purpose of routine maintenance checks and repair as needed; the dealer also provided an on-call emergency service in case of breakdowns. (In the West Virginia program this was a Guardian Maintenance Agreement through Raleigh Motors, the local International dealer.) Maintenance of the media equipment and other specialized equipment in the mobile classroom were the responsibility of the teacher.

From one year's operation in West Virginia, $40 per week for 40 weeks was estimated for covering repair, routine maintenance, and gasoline costs. Insurance and license fees amounted to an additional $900. This $2,500 is the total estimated annual operating cost for the mobile classroom.

No criteria were defined for establishing a firm amortization table for the major equipment items. A very conservative five-year estimated amortization schedule is used in a subsequent section of this report.

Program Performance

Program performance was defined theoretically as learning which occurred in the target population--3-, 4-, and 5-year-old children--as a result of the AEL Early Childhood Education Program. Learning was categorized according to language, cognition, psychomotor, orienting and attending, and affective. The first four categories were used for conceptualizing the behavioral objectives for the program.[1] The affective category was added after initiation of the field test. For the year's field test, learning in the language and cognitive areas was studied.

Language was defined operationally as responses to the Illinois Test of Psycholinguistic Abilities (ITPA) and responses to silent movies designed to encourage language production. Cognition was defined operationally as responses

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[1]Frank H. Hooper and William H. Marshall, The Initial Phase of a Preschool Curriculum Development Project (Charleston: Appalachia Educational Laboratory, Research and Information Center, 1968), pp. 97-197.

to the Peabody Picture Vocabulary Test (PPVT) and responses to the Appalachian Preschool Test of Cognitive Skills, a picture test similar in format to the PPVT and the ITPA. Intelligence was included in the category of cognition. Interest was defined operationally as responses to an attitude checklist developed by AEL staff and responses reflected in anecdotal records taken during the year.

Since the early childhood program was home-oriented, the parents were considered a secondary target population. Learning on the part of parents was categorized according to interest, attitude, and motivation. Interest and attitudes were defined operationally as responses on individual items in an attitude checklist and a parent attitude questionnaire developed by the AEL evaluation staff. Motivation was defined theoretically as sustained level of attitude and/or interest and operationally as the average response to all items on the attitude checklist.

Additional data were collected aimed at measuring program performance in terms of the general attitude and role acceptance of the mobile classroom teacher and paraprofessionals. Attitude was defined operationally as responses recorded during an interview schedule and theoretically as readiness to respond (mental set) at the time they were confronted with the instruments.

The program performance inquiry was guided by eight questions on student performance, six questions on parental performance, five questions on paraprofessional performance, and four questions on mobile classroom teacher performance.

Student Performance

Interest level. The interest level of children started high and remained reasonably high for the duration of the first year. There was a slight decline, however, from the beginning to the end of the year. The mean attitudinal

response was 0.74, on a scale of 0.00-1.00, at the beginning of the year and 0.53 at the end, a mean difference of 0.21. A detailed analysis of interest level is contained in Appendix B; however, only partial data were available for this analysis.

A separate question in the evaluation plan sought to determine student interest in the television lessons only. Data were taken from the anecdotal records of home visitors, based on the 300 children in the total package group and the TV and home visitation group. Measurements were based on a ratio of positive to negative comments pertaining solely to the television lesson on a week-to-week basis. The interest remained relatively constant for the year.

On a scale of 0.00-8.00, the positive to negative ratio ranged from 1.21 for 3-year-olds to 1.89 for 4-year-olds to 2.17 for 5-year-olds. See Figure 1 of Appendix B for the detailed analysis.

Intelligence level. Intelligence was defined theoretically as the extent to which children could correctly recognize pictures and was defined operationally as responses to the Peabody Picture Vocabulary Test. It was assumed that verbal ability was directly and positively correlated with intelligence. The general intelligence level of 3-, 4-, and 5-year-old children did increase significantly. However, the data did not support any contention that the ECE program contributed to the increase in general intelligence. There was a gain of approximately 8.4 IQ units among all treatment groups in the six-month period. Of the four treatment groups, the group that ordinarily would have been expected to gain least because of no exposure actually gained the most. A detailed analysis is included in Appendix C; however, only partial data were available for this analysis.

Growth in language development of 3-, 4-, and 5-year-old children. A qualified yes can be given to the question on growth in language development. Pre- and post-test using the Illinois Test of Psycholinguistic Abilities was used to measure the operational gain in language development. The pretest, however, was administered 60 days after the beginning of the field test.

The ITPA consists of the following 12 subtests:

1. Auditory reception
2. Visual reception
3. Auditory/vocal association
4. Visual/motor association
5. Verbal expression (vocal encoding)
6. Manual expression (motor encoding)
7. Grammatic closure
8. Supplementary test 1--auditory closure
9. Supplementary test 2--sound blending
10. Visual closure
11. Auditory sequential memory
12. Visual sequential memory

Supplementary test 1, auditory closure, and supplementary test 2, sound blending, were not used for this study.

Only Subtest 5, verbal expression, was directly related to the behavioral objectives sought during the year. The objectives were:

1. To identify and describe an object in terms of its physical characteristics.

2. To identify and describe an object in terms of its function.

3. To identify and describe an object in terms of its location.

Instruction aimed at these objectives was given during the last two months of the year.

Subtest 5 measures the child's ability to express his own concepts verbally. According to the authors, it will:

> Assess the ability of the child to express his own concepts vocally. The child is shown four familiar objects one at a time (a ball, a block, an envelope, and a button) and is asked, "Tell me all about

this." The score is the number of discrete, relevant, and approximately factual concepts expressed.[2]

Data presented in Table III indicate that children receiving all three program components scored significantly higher than the two other treatment groups and the control group.

Table III

Gains in Verbal Expression

Groups	Units Gain
Television, Home Visits, and Mobile Classroom	4.37
Television and Home Visits	0.05
Television	1.41
Control	1.63

Gains reflected on other subtests were erratic, probably because they were not directly related to language objectives used in the first year. A detailed report is included in Appendix D. The data were insufficient for a comprehensive analysis.

Language development in 5-year-old children. This study of language development was conducted under the auspices of Dr. William J. Griffin at the Institute on School Learning and Individual Differences at George Peabcdy College for Teachers in Nashville, Tennessee. The AEL staff collected data on the 3-, 4-, and 5-year-old children in the target population, and the comparison was made with 5-year-old children in a Tennessee kindergarten. The following conclusions were reported:

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[2]Samuel A. Kirk, James J. McCarthy, and Winifred D. Kirk, Examiners Manual Illinois Test of Psycholinguistic Abilities (Urbana: The Board of Trustees of the University of Illinois, 1968), p. 11.

1. The language sample studied reflected a lack of fluency in children who produced them.

2. The 5-year-olds in the AEL sample generally exploited the syntactic resource of the language as proficiently as did the conventional kindergarten children.

This evaluation report, including the purpose of the study, the sampling analysis, an explanation of the analysis, processing and reporting of the data, interpretation, and conclusions, is included in Appendix E. Again, only partial data were available for this analysis.

Cognitive growth. Cognition was defined theoretically as the ability of a child to recognize numbers and symbols correctly and to make associations. Operationally it is defined as responses to a 95-item test developed specifically for the AEL program curriculum. Of the 95 items, children receiving TV, mobile classroom instruction, and home visitation and the group receiving TV and home visits responded correctly to 45 per cent of the items; whereas, the other two groups responded correctly to only 33 per cent. This difference represented an estimated 36 per cent gain in cognitive behavior. However, there was no significant difference between the TV, home visitor, and classroom group and the TV and home visitor group; but there was a significant difference in the TV (only) group over the control group. See Appendix F for the detailed analysis.

General. Two other attempts were made to assess general program performance. An effort was made to determine the separate and interdependent effects on language development and cognition of television instruction, home visitation, and mobile classroom instruction. Only partial data were available. Also, a study was made of the process of reporting pupil reactions and incorporating them in subsequent program activities.

Several factors contributed to the difficulty of assessing the component influences on language and cognitive development. The mobile classroom was used for only the last four months and its basic function was to

strengthen orienting and attending skills. There is some suggestion that TV viewing and mobile classroom attendance were negatively interactive. For example, it is possible that parents of the children in the mobile classroom treatment group took less in-home interest in their children on the assumption that the mobile classroom experience was instructionally adequate. Conversely, it is possible that parents of children in the television-plus-home visit treatment group increased their levels of involvement because there was no concern about doing something that would not be pleasing to the teacher. An equally plausible explanation is that parents increased their involvement levels in an unconscious or intentional effort to compensate for the missing mobile classroom experience in the lives of their children.

The data did indicate, however, that the 30-minute daily television did have a true effect on cognitive behavior and that the weekly half-hour home visit had an additional effect. No additive effect was produced on cognitive behavior by the mobile classroom, but a significant effect was discerned in growth in verbal expression with the addition of the mobile classroom.

Relative to feedback from home visitors on pupil reactions, a weekly report was submitted on each child. These reports were studied in program planning sessions twice per week. Program adjustments were made as quickly as possible. For example, evidence in November of 1968 indicated that the interest of 5-year-olds was lagging, apparently because programs were geared more toward 3- and 4-year-olds. A successful adjustment was made by December. Experience indicated that it took approximately one month to incorporate corrective feedback into program production.

Parent Performance

Program performance based on parent participation in the program was measured in terms of general parent interest and cooperation, parent motivation

as determined by attitude toward several aspects of the program, and parent assessment of their children's behavior resulting from participation in the program. It was considered, however, that only partial data were available for the assessment of any of these results.

Parent interest. General parent interest was based on a week-to-week assessment of attitude toward the "home visit" and attitude toward the "ECE program." Parent interest virtually paralleled the interest registered for the children. It is acknowledged that the home visitor "filtered" these responses of parents just as parents undoubtedly filtered children's reactions. The detailed analysis is contained in Appendix B.

Parent motivation. The level of parent motivation was recorded in terms of the year-long average, attitudes toward separate components of the program, and the variation in attitude in accordance with the addition of components. The operational definition of motivation level was the combined average for all nine items on the attitude checklist scale pertaining to parents as recorded by the home visitors. A fairly stable year-long average of 0.76 on a scale of 0.00-1.00 was recorded.

The assessment of parent attitude toward the home visitation and mobile classroom components is shown in Table IV, page 17.

Home visitors rated parental attitude toward television lessons 0.74 on a 0.00-1.00 scale. Table V, page 17, shows the percentages of children and parents who watched TV lessons four and five days per week by treatment groups.

Data in Table V indicate that parent interest in TV lessons was definitely stimulated by the activity of the home visitor. The mobile classroom, however, appeared to have no effect on television lesson interest.

A further attempt was made to determine general parent motivational level in relation to program components. Inferences were drawn from parent

Table IV

Parent Attitude Toward Home Visitation and Mobile Classroom Components of the Early Childhood Education Program

Program Component	Source and Type of Data	Per Cent Response
Home Visitation	Parent response: home visitor should visit home once a week to be most effective.	96
	Parent response: materials left by home visitor were either "excellent" or "very good."	89
	Parent response: home visitor explained materials "excellent" or "very good."	89
	Home visitor: positive attitude of parents toward materials.	80
Mobile Classroom	Parent response: child talks about things done in mobile classroom.	96
	Parent response: parent had opportunity to visit mobile classroom.	70

Table V

Percentages of Children and Parents Who Watched Television Lessons Four and Five Days Per Week by Treatment Groups

Treatment Group	Days Per Week	Per Cent Watching	
		Parents	Children
TV, Home Visits and Mobile Classroom	5	23	41
	4	41	42
Television and Home Visitation	5	27	47
	4	29	35
Television	5	10	20
	4	17	24

responses on the attitude questionnaire completed by parents. A significantly higher percentage of parents participating in the program where all three components were used gave positive responses to most of the questions pertaining to behavioral change in the child or in total family than the parents whose children received only television instruction. The second highest response came from the group receiving television instruction and home visitation.

In summary, the highest positive influence on parents seemed to come from home visitations. However, it must be recognized that a degree of empathy developed between parents and home visitors that could have influenced parent responses to items in the questionnaire. Also, as indicated in Appendix G, those factors which are more conducive to desired behavioral changes (residence owned or rented, schooling of parents, etc.) were more prevalent in the group receiving all three components of the program than in the group receiving only two.

Parent assessment of children's behavior. A decided majority of parents indicated that they had observed a difference in the behavior of their children since enrolling in the program. Responses to six subquestions contained in Appendix H are shown in Table VI.

Table VI

Parent Observations of Changes in Children's Behavior

Behavior Observed by Parents	Per Cent of Parents Responding Yes
Plays better with other children	82
Expresses himself better	89
More aware of things around him	89
More able to do things for himself	90
Less shy around adults	83
More able to follow instructions	91

Performance of Home Visitors

Performance of home visitors was defined theoretically as the role they played in the program and the attitude they held concerning their role. Responses to a Home Visitor Questionnaire and a Home Visitor Survey were used as the operational definitions of their role and attitude. Questions dealt with relationships with parents and children, feelings about their vital part in the program, their relationships with other program components and component personnel, and their personal criticisms of the program. Sufficient data to reach conclusive answers were available only on home visitor's feeling about their vital role in the program.

Responses of home visitors indicated that they spent a slightly greater amount of time with parents than with children. See questions II and IV of HVQ in Appendix I.

Home visitors, as reflected by the tabulation in Appendix I, definitely feel that they perform a vital role in the operation of the program.

Only inferences are possible relative to the relationship of home visitors to other program personnel. Responses to Question III, Appendix I, were positive relative to mobile classroom personnel. One home visitor expressed some negative attitudes toward TV lesson production methods, and one decidedly hostile remark was made in response to Question 7 of the Home Visitor Questionnaire.

Questions 2, 3, 4, 5, and 7 of the Home Visitors Survey provided opportunity to appraise the educational program. Prominent criticisms, with numbers of home visitors shown in parentheses, were as follows:

1. Too much testing (4).
2. The feedback questionnaire (7). Some requested that it be simplified, some that it be eliminated altogether, and some that less writing be required.

3. Weekly trips required for meeting in central (Beckley, W. Va.) office (4). Three wished for a meeting every two weeks, and one asked for monthly meetings.

4. Too many review TV programs (3).

5. Travel problems on winter roads (3).

6. Home visitor training (4). The three-week preliminary training session was disliked. Seven of the eight indicated that subsequent training programs consist of traveling in the field with an experienced home visitor.

Mobile Classroom Teacher Performance

No data were collected for the four questions on this phase of the evaluation plan.

Program Performance Pervasiveness

Program performance pervasiveness is defined theoretically as the base for diffusing the Early Childhood Education Program. Program performance pervasiveness is defined operationally as the number and type of individuals that can be affected by operation of the program.

The pervasiveness of a program under development, especially a program such as the AEL Early Childhood Education Program, may be very different than the program when made operational. The AEL Early Childhood Education Program is designed to operate on a regional basis encompassing several school systems. The television lessons broadcast from the Oak Hill station have been reaching homes over an eight-county area of southern West Virginia. For development purposes, however, the mobile classroom and home visitation components have been extended to the number of youngsters required to try the program and conduct sufficient evaluation of it--approximately 300 children for home visitation and 150 for mobile classroom instruction. To determine program pervasiveness, however, all three components must be adjusted to the most appropriate interface. The program is considered to be a unified set of

activities comprised of television instruction, home visitation, and mobile classroom instruction. The program is not designed to operate in less than one region; and for optimum conditions for operation, it should be conducted in several regions simultaneously--even on a state or multi-state basis.

In this report program performance pervasiveness will be predicated on the eight-county area in southern West Virginia in the Oak Hill television broadcast area. Data for the report have been collected on the numbers of preschool children and parents of preschool children in the area; the number of school systems and school personnel in the area; and the socioeconomic status of the population in the area.

Counties, School Systems, and School Personnel

The eight counties falling within the Oak Hill television viewing area are:

Fayette*	Mercer*
Raleigh*	Wyoming
Monroe	McDowell
Nicholas	Summers*

Field trial units are located in those counties marked with an asterisk.

There is one public school district, coterminous with the county boundary, operated in each county. According to the West Virginia 1967-68 Education Directory, there were 374 administrators--superintendents, principals, and supervisors--employed in the eight school systems. There were 489 first-grade teachers employed in the area.

Socioeconomic Status of Population

Eight criteria were used to rate the socioeconomic status of the eight-county area. Data were based on 1960 census information. Table VII, page 22, presents the data by each criterion, for the United States, West Virginia, and the eight-county area.

Table VII

Census Data for the United States, West Virginia, and an Eight-County Area of Southern West Virginia

Census Criteria	United States	W. Va.	Eight-County Area
Population per square mile	51	77	87
Population change (1950-60)	18%	-7%	-17%
Urban population	70%	38%	20%
Adults age 25 and over completed high school	41%	31%	23%
White collar workers	41%	36%	33%
Manufacturing workers	27%	23%	10%
Median family income	$5660	$4572	$3876

Children and Parents Served

Based on the best census data available and first grade enrollments in the eight-county area, it is estimated that there are 50,000 preschool children, age 0-6, of which approximately 25,000 are 3, 4, and 5 years of age. Based on a study group sample there were 0.84 families per child which if projected to the eight-county area would suggest that approximately 21,470 families would be affected. In the sample group, 91 per cent of the families had both parents in the home, suggesting that a total of 40,578 parents potentially could be involved in the program.

Program Cost Analysis

Two useful cost analyses may be made with regard to the AEL Early Childhood Education Program. Expenditures for the field test of the program during the 1968-69 school year, of course, represent developmental costs and may or may not bear significant relationships to the costs of the program under operational conditions. For purposes of this report, therefore,

expenditures will be reported for the 1968-69 field test of the program which are considered developmental costs. These costs correspond to program effort reported in the first section. Then operational costs of the program will be projected based on the performance pervasiveness of the program as discussed in the previous section. After these presentations and analyses, implications will be described for school system operation and support of the program.

Development Costs

Development costs included in this report cover 1968-69 field test activities only as reported in the Program Effort section. An amount of approximately $68,600 expended for background research and the development of learning objectives prior to initiation of the field test are not included. No attempt is made to derive a per pupil cost based on expenditures for development; for, as previously explained: (1) television instruction was available to approximately 25,000 youngsters even though only 450 of these youngsters were included in the field test; and (2) approximately 300 children were provided home visits while only 150 would have been needed to serve the single treatment group receiving the three-component program.

Expenditures were maintained separately for television instruction, home visitation, and mobile classroom instruction. Amounts by program components were as follows:

Television Component	$150,680
Home Visitation Component	$ 53,165
Mobile Classroom Component	$ 58,709

Line item expenditures by program components are presented in Table VIII, page 24.

Operational Costs

Operational costs projected here are based upon expenditures during the first year of field testing but adjusted to program performance pervasiveness

Table VIII

Developmental Costs of the Early Childhood Education Program
During the 1968-69 Field Test

Program Component	Item of Program Effort	Expenditures	
Television	Professional Personnel	$76,420	
	Production Assistance	1,530	
	Consultants	1,500	
	Secretarial	6,090	
	Production Studio	23,000	
	Broadcast Station	4,200	
	Equipment	14,440	
	Supplies	17,500	
	Travel	6,000	
Component Total			$150,680
Home Visitation	Professional Personnel	$12,845	
	Paraprofessionals	27,000	
	Consultants	1,700	
	Secretarial	3,320	
	Office Space	2,300	
	Travel	6,000	
Component Total			$ 53,165
Mobile Classroom	Professional Personnel	$23,985	
	Paraprofessional	3,375	
	Secretarial	3,320	
	Mobile Classroom	20,329	
	Power Connections	1,500	
	Classroom Operation and Maintenance	2,500	
	Power Supply	400	
	Office Space	2,300	
	Travel	1,000	
Component Total			$ 58,709
PROGRAM TOTAL			$262,554

described in the preceding section. Operational costs are based upon service of the program to 25,000 three-, four-, and five-year-old children estimated for the eight counties incorporating the field testing site.

As indicated previously, television lesson broadcasts covered the total area; therefore, no significant increase in this component cost would be required under operational conditions. Based, however, on the use of one mobile classroom unit--classroom, teacher, and aide--for each 150 children, 167 units would be required to serve the 25,000 pupil population. For the home visitation component, based upon four home visitors for each 150 pupils (group per mobile classroom unit), a total of 668 paraprofessionals would be required to perform home visits to 25,000 youngsters in the area. Estimated expenditures based upon this application are presented in Table IX, page 26.

It is important to recognize that data included in Table IX are based on a first-year field test only. The data can be refined considerably during the second and third years of field testing. Some estimates can be reduced; others no doubt will be increased. At least two additional positions are needed in tne curriculum materials team, and much larger volumes of materials would be required for program operation serving 25,000 youngsters. In the category of equipment for TV lesson production, the developmental effort is being conducted using rental equipment primarily. If the program were made operational, especially on a large scale, it would be more economical to build, equip, and operate studio facilities. Also, it is recognized that if capital outlay expenditures were excluded from current operating expenses, as is customary in expenditure classifications for public school operation, operating expenses as reflected in Table IX would be reduced.

Calculations for expenditures for the mobile classroom component were based upon 150 students per classroom unit. Experience indicates that a mobile classroom unit may be capable of serving up to 200 pupils. Under

Table IX

Estimated Annual Costs for Operation of Early Childhood Education Program in Eight-County Area for 25,000 Children

Program Component	Basis for Estimate	Total Cost	Per Pupil Cost
Television	Equipment acquisition and installation as shown in Table I, page 5, and personnel and consultant time as shown in Table II, page 7.	$137,628	$5.50
Home Visitation	668 paraprofessionals and other personnel requirements as reflected in Table II, page 7. Also field office facilities and travel for home visitation.	$2,740,565	$109.62
Mobile Classroom	167 mobile classrooms and equipment as shown in Table I, page 5; 1,670 power connections; field office; and mobile classroom operation and maintenance. 167 mobile classroom teachers and aides and other personnel time as reflected in Table II, page 7.	$3,655,725	$146.23
	TOTAL	$6,533,918	$261.35

operating conditions the mobile classroom unit would move much shorter distances between stops, and in some cases two and three groups of students might be served in one location. Service to more pupils per unit and reduced operating and maintenance costs would reduce per pupil costs for the mobile classroom component. Also, the unit cost of the mobile classroom can be reduced considerably when purchased in quantity.

The basis for calculating the number of home visitors was four for each 150 youngsters--the number served by one mobile classroom. Experience also indicates that four home visitors are capable of serving slightly more than this number. This would be more nearly true under operating conditions where families and groups were located more closely together, and obviously this would reduce the cost of travel for home visitors.

Estimated Cost by School System

Were the AEL Early Childhood Education Program made operational, costs of the program would fall on individual school systems. Although the program would necessarily be operated jointly by them, each county school system should be responsible for its per pupil support of the program. This is not to say that support of the program should be derived from county revenues; they might be local, state, federal, or any source of funds or a combination of these, but the per pupil cost should be established on the eight-county basis with each school system participating according to its number of students. Based upon per pupil costs reflected in Table IX, page 26, the estimated annual cost of the program by county would be as shown in Table X, page 28.

Table X

Estimated Annual Cost of the AEL Early Childhood Education Program by County School System

School System	Number of 3-, 4-, and 5-year-old Children	Estimated Cost
Fayette	4,350	$1,136,872
Raleigh	5,490	1,434,811
Monroe	690	180,331
Nicholas	1,860	486,111
Mercer	4,560	1,191,756
Wyoming	2,880	752,688
McDowell	4,740	1,238,800
Summers	990	258,737
TOTAL	25,560	$6,680,106

Evaluation Synthesis

Far overshadowing all other factors in the first-year evaluation of the AEL Early Childhood Education Program was the demonstrated complexity of planning, designing, testing, monitoring, and modifying an alternative education program for young children. The establishment of formative evaluation procedures and instrumentalities consumed enormous resources, and yet this first-generation effort was probably no more than a crude approximation of future procedures. The management expertise required to coordinate, supervise, and direct the three-component program vigorously tested the institutional reservoir of managerial skills. Based upon the year's experience, it is highly probable that program evaluative and managerial requirements will increase rather than diminish in the second and third year tests. The

availability of funds to meet these requirements will be crucial to the total program development effort.

The first-year evaluation of this program was cast on four dimensions:

1. Program Effort

   What types and quantities of resources were necessary to operate the program?

2. Program Performance

   What was the program effect on the primary and secondary target population?

3. Program Pervasiveness

   Who and how many individuals could be affected by a typical program built along the dimensions of the development model?

4. Program Costs

   What are the probable operational costs of a typical program constructed along dimensions of the development model?

The question of program performance is central to all other considerations. If a useful outcome cannot be reliably produced in specified target groups, then effort, costs, and exportability are irrlevant. How well, then, did the primary target group--3-, 4-, and 5-year-old children--achieve program objectives? In summary:

- The evidence suggested that the television lessons and home visitations had a true positive effect on the cognitive development of the children. The data did not support a similar conclusion for the mobile classroom.

- In language development (verbal expression), children in the three-component program scored significantly higher than other treatment groups and the control group.

Other findings indirectly related to pupil achievement include:

- Children's interest in the program was relatively high for the year with only a slight decline over the nine-month period.

- Older children tended to like the television lessons better than younger children.

- No claim can be made that the program improves intelligence measures of children.
- Parental interest in the program paralleled the children's interest.
- Parental motivation was high and fairly stable throughout the year.
- The home visitors contributed significantly to the motivations of parents.

Baseline program pervasiveness data would suggest that an operational program in southern West Virginia fleshed out along the dimensions of the current development model would affect eight school systems, 374 school administrators, 489 first-grade teachers, 21,470 families, and 25,000 three-, four-, and five-year-old children. The effort required for such a program would necessitate an annual outlay of $137,628 for adequate television hardware-personnel capability; $2,740,565 for 668 paraprofessionals and other personnel required to perform home visitation services; and $3,655,725 for 167 equipped mobile classrooms, teachers and aides, and miscellaneous support services. The total annual cost would be $6,553,918 or $261.35 per pupil.

A caveat: All program effort, performance, pervasiveness, and cost data should be considered tentative until confirmed or rejected by the scheduled second and third year field tests. The estimation of operational costs from development costs is particularly hazardous and may be subject to gross error correction with subsequent field testing.

In summary, first-year data suggest:

- Children to learn specified behaviors, and this learning is associated with a systematic program.
- The program costs 50 per cent less per year than educating a child in a conventional classroom.

Appendix A

EVALUATION PLAN FOR AEL EARLY CHILDHOOD EDUCATION FOR CONTRACT YEAR 1969

APRIL 29, 1969

James T. Ranson

Appalachia Educational Laboratory
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Charleston, West Virginia

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Program for Early Childhood Education

Introduction

The evaluation strategy of the Appalachia Educational Laboratory includes formative evaluation, summative evaluation, and pay-off evaluation. There are three phases of formative evaluation, i.e., context, input, and process. The Early Childhood Education program has passed through the context and input phases. The outcome of formative context evaluation was a decision that the need existed for an enriched educational environment for Appalachian preschool children. The outcome of the formative input evaluation was a decision to use a combination of television, paraprofessionals, a mobile classroom, and a specially developed curriculum to provide a home-oriented preschool program. Decision concerning the feasibility of the proposed preschool program will result from the formative process evaluation. The result of the summative evaluation will be a decision concerning the quality of the program and the effectiveness of the program. The Early Childhood Education plan is designed for formative and summative process evaluation.

The Early Childhood Education program became operative September 1968 and is scheduled to terminate September 1971, spanning four contract years. Three major evaluation events are scheduled--September 1969, September 1970, and September 1971. The Early Childhood Education evaluation is organized to support these three evaluation events. The first evaluation event,

September 1961, will be a documentation of decisions and changes made during the first year's operation, and those changes judged to be necessary for the second year's operation. The second evaluation event, September 1970, will be a documentation of the revisions and modifications made during the first two years' operations and those proposed for the third year's operation. Finally, the third evaluation event will be a documentation of the results of three years' evaluation activities (i.e., summative evaluation).

For contract year 1969 the Early Childhood evaluation activities are designed to (1) provide information concerning the program installation, operation and maintenance; (2) identify, develop and refine preschool children's performance measures in the areas of language development and cognition for the second year's evaluation; and, (3) collect base-line data for the summative evaluation.

The evaluation design is organized according to role definition, data collection, data organization, data analysis, information recording, and managing the evaluation activities.

I. EVALUATION ROLE FOR EARLY CHILDHOOD EDUCATION. The evaluation role is defined by the critical decision-makers, the critical decision situations, and the criteria utilized in making the decisions.

   A. Decision-Makers. There are three groups of AEL decision-makers--Program, Field, and Evaluation. They are:

1. Program - Mr. Roy Alford, Mr. Don Nelson, Dr. William Bost.

2. Field - Mr. Roy Alford, Dr. Robert Childers.

3. Evaluation - Dr. James Ranson, Dr. Robert Childers, Mr. Kee Chang.

B. Decision Situations. There are five categories of decision situations to which the decision-makers will address themselves: effort, performance, pervasiveness, efficiency, and a synthesis of the previous four categories.

1. Program Effort. The program effort decision situation is characterized by assessing the installation, operation and maintenance in terms of time, cost, and personnel. The following questions will define the Early Childhood Education effort decision situation:

a. Installation. Answers to questions relative to this area will help establish a basis for determining how much effort is required to prepare for operation.

1) How many major pieces of equipment are required for each of the three components of the program?

2) What is the cost of the equipment in terms of the program components and total program cost?

3) What facilities are necessary for housing the Early Childhood Education program?

4) What local school, church, or other community facilities are required and what modifications, if any, are needed?

5) How much time is required for installing the program?

6) Who is responsible for providing installation personnel and what personnel are required?

7) What, if any, are the legal requirements for installing the Early Childhood Education program?

b. Operation. Answers to questions relative to this area will help establish a basis for determining the effort required for operating under field conditions in terms of personnel and financial requirements.

1) How much field managerial effort is required?

2) How many and what types of agencies are required for operation?

3) How many field man-hours are required to operate the program?

4) What preservice and inservice programs (with their respective intrinsic evaluations) are necessary for operation?

5) How are costs associated with questions 1) through 4) to be accounted for?

6) Are the video tape recordings and other related materials consistent with the behavioral objectives?

7) How are the priorities assigned to the behavioral objectives?

c. Maintenance. Answers to questions relative to this area will help establish a basis for determining how much effort is required to maintain the program.

1) What procedures have been worked out for maintaining the equipment?

2) What costs have been projected for maintaining the mobile classroom equipment?

3) How will the equipment be amortized?

2. Program Performance. Answers to questions in the preceding section will provide a basis for evaluating the effort required to install, operate and maintain the program. This section presents a series of questions pertaining to the results of the effort. The performance questions are organized according to students, parents, paraprofessionals, and mobile classroom teacher.

a. Student performance. For this contract year these questions will be restricted to language development and cognition areas. The social development and psychomotor areas will be assessed during contract year 1970. This schedule was adopted for the following reasons:

First, the curriculum development team needed time to become acquainted with developing the video tape recordings for television broadcast and other ancillary materials. It was assumed that one year was sufficient time for most major revisions to be made.

Second, the mobile classroom was not available for the first four months operation, thus the major thrust for teaching social development and psychomotor skills was not a part of the program for 44% of the time for the first year.

Third, resources for developing curriculum specific measures (or adapting existing measures) in the social and psychomotor domains were unavailable in time for the first year's evaluation. The program is based on behavioral objectives requiring curriculum specific measures. Experience was needed for assigning priorities to the behavioral objectives for which television broadcast and ancillary materials would be development. Accordingly, for contract year 1969, answers to the following questions will be sought:

1) Can the interest level for 3, 4, and 5 year old children be maintained with essentially the same program?
2) Does the general intelligence level of the 3, 4 and 5 year old children increase significantly?
3) What is the status of the language development of the 3, 4, and 5 year old children in the study?
4) Is there any significant growth in language development for the first year's operation on the part of 3, 4, and 5 year old children?
5) What is the extent of growth in the cognitive area during the first year's operation?
6) Do the television programs instill and maintain interest of the students?
7) How are pupil reactions incorporated into subsequent program development?

8) To what extent does television, the para-professionals, and the mobile classroom contribute independently and in combination to language development and cognition in 3, 4 and 5 year old children? (See Appendix B)

b. Parent performance. Questions concerning children's parents will be confined to the affective area.

1) Does the program maintain parents' interest?
2) Do parents notice any difference in their children's behavior since enrolling in the program?
3) What is the general attitude of parents toward the different components of the program?
4) What is the motivational level of the parents?
5) Does parent motivation appear to vary with the addition of the mobile classroom or the home visitor, or a combination of both?
6) How do fathers and mothers compare in participation in the program?

c. Paraprofessional performance. For this phase para-professionals will provide data relative to general attitude and acceptance of their roles.

1) Do the home visitors relate more to the children's parents or to the children themselves when they visit the homes?
2) What and how many major criticisms do the para-professionals have concerning the educational program?

3) Do the paraprofessionals feel that they are a vital part of the operation?

4) How do the home visitors relate to the personnel in the other program components?

d. Mobile classroom teacher performance. For this phase answers to questions concerning the general attitude and acceptance of the role in the program will be sought.

1) Does the mobile classroom teacher involve the children's parents in the mobile classroom activities?

2) What and how many major criticisms does the mobile classroom teacher have concerning the educational program?

3) Does the mobile classroom teacher see herself as a vital part of the Early Childhood operation?

4) How does the mobile classroom teacher relate to the personnel in the other program components?

3. Program performance pervasiveness. This decision situation will be defined by questions concerning the maximum operation of the Early Childhood Education in field locations. This can be thought of as the total population which the program can potentially serve. Concern is directed toward the total number of persons the program can serve. The previous section concerned a sample from the population.

a. How many 3, 4, and 5 year old children are there in

the area in which the program is operative?

b. How many parents in the area in which the program is operative could be directly and/or indirectly involved?

c. How many administrators, including principals and supervisors, are there in the area in which the program is operative?

d. How many school systems are there in the area in which the program is operative?

e. How many first grade teachers are there in the operating area?

f. What is the total population of children under six years of age in the area in which the program is operative?

g. What is socio-economic status of population?

4. Program efficiency. This decision situation will be defined by questions concerning the total cost of the program effort in relation to the total number of people involved in the area in which the program is operating. Efficiency, therefore, can be thought of as a ratio of the amount of money or resources it takes to operate the program to the output or performance that the program achieves.

a. What is the annual cost per pupil per year for operating the program?

b. What is the annual cost per pupil for operating the television element of the program?

c. What is the annual cost per pupil for operating the

home visit element?

d. What is the annual cost per pupil for operating the traveling classroom element of the program?

e. What is the annual cost per local school unit for operating and maintaining the program?

5. Program synthesis. This decision situation is characterized by organizing the information generated in the previous four categories for the purpose of making final decisions concerning the first year's operation of the program. The decision-makers, identified in an earlier section, will produce questions for this section upon analysis of responses to previously stated questions. The questions will pertain to modifications and revisions in the program required for operation during the 1969-70 school year.

C. Decision Criteria. This section will specify the criteria for each of the decision situations outlined in the previous section. The following criteria are directly related to and organized by the questions as cited in Section 1B.

1. Effort. The three categories of criteria for the program effort are:

a. Installation. Criteria concerning program installation are:

1) The number of pieces of equipment required to operate the program.

2) The cost of the program equipment within each of the three components and the total cost.

3) The amount of square feet required for offices,

work space and storage.

4) The number of local school, church, or other community facilities utilized and the cost of any necessary modifications.

5) The period of time from the day on which each of the three program components was delivered to the field site to the time in which it first began operation.

6) The number of person(s) or agency(s) responsible for identifying, selecting, employing, and training personnel for the installation of the program.

7) The number of laws pertaining to the legal operation and the number pertaining to enabling legislation for the program.

b. Operation. Operation criteria are:

1) The number of people involved in managing the program in the field, the amount of time they devote to managing the operation, and the cost of managing the operation.

2) The number of agencies and the name of each agency required for operating the program.

3) The number of man hours required to operate the program.

4) There will be a separate document reporting on the consistency analysis (intrinsic evaluation).

5) The number of financial sources and the number of budgets.

6) There will be a separate document reporting on the inservice training for the home visitors (intrinsic evaluation).

7) There will be a separate document in rank ordering of objectives. Criteria will be derived from these documents.

c. Maintenance. Maintenance criteria are:

1) A description of the procedures used in maintaining program equipment including individuals responsible for such maintenance.

2) The amount of money in dollars.

3) A ratio of time projected for the equipment to be used and the cost in dollars it takes to purchase, maintain and operate the equipment.

2. Program performance. Program performance criteria are:

a. Student performance. Student performance criteria are:

1) Three questions with a seven point scale.

2) Scores from the Peabody Picture Vocabulary Test for intelligence.

3) Scores from the Illinois Test of Psycholinguistic Ability for status of language development.

4) The number of kernel sentences embedded in a T-unit for growth in language development.

5) The number of behavioral objectives correctly demonstrated in a 70 (tentative number) item curriculum specific for acquisition of cognitive concepts.

6) The number of favorable comments gleaned from the anecdotal records secured by the paraprofessionals for how well children relate to the television program.

7) The number of modifications made in a television broadcast as a result of pupil reactions for how well pupil reactions affect program development.

8) The number of kernel sentences in a T-unit and the number of behavioral objectives successfully demonstrated in the curriculum specific test for program components.

b. Parent performance. Parent performance criteria are:

1) Two questions each with a seven point scale for parent interest.

2) The number of behavioral changes reported by parents criterion for whether or not they notice any difference in their children's behavior since enrolling in the program.

3) The number of questions concerning the various components of the program for attitude of parents toward the various components.

4) The mean percentage of tallies given to nine questions each with a seven point scale for parent motivational level.

5) The mean will be calculated in the same manner as in the previous question, only for the "package" and TV plus home visitor groups.

6) The number of fathers and mothers that serve as the major contact for the home visitor.

c. Paraprofessional performance. For paraprofessional performance the criteria are:

1) Four questions each with a five point scale determining relation of home visitors to children's parents and to the children.

2) The number of negative and constructive criticisms gleaned from anecdotal records for determining paraprofessional criticism of the program.

3) Six questions each with a five point scale for how the home visitors relate to the personnel in the other program components.

4) Six questions each with a five point scale for paraprofessional's role.

d. Mobile classroom teacher. The mobile classroom teacher performance criteria will be:

1) Four questions each with a five point scale for determining how the mobile classroom teacher involves the parents and the mobile classroom activity.

2) The number and kind of criticisms that the mobile classroom teacher reveals during a 20-minute interview for major program criticisms.

3) Six questions each with a five point scale for determining mobile classroom teacher involvement.

4) Six questions each with a five point scale for determining how the classroom teacher relates to personnel in other program components.

3. Program Performance Pervasiveness. Criteria for program performance pervasiveness are:

   a. The number of 3, 4, and 5 year old children in the area where the TV broadcast is received.

   b. Number of parents in the area in which the program is broadcast.

   c. Number of school systems in the area where the program is broadcast.

   d. The number of superintendents, assistant superintendents, principals, vice principals, and supervisors.

   e. Number of first grade teachers in the school system where the program is operative.

   f. The total number of children under six years of age at October 1, 1968.

   g.

4. Program efficiency. Ratios will be used as the criteria for answering program efficiency questions. They are:

   a. Number of pupils in area to total estimated cost for operating the program for those pupils.

   b. Number of pupils to total cost for operating the television element of the program.

   c. Number of pupils who can be served by one home visitor to the average cost of the home visitor

operation.

d. Number of pupils who can be served by one traveling classroom to the total estimated cost of operating one for a year.

e. A breakdown of the ratio in 'a' above according to number of children per school system and number of school systems in operating area.

5. Program synthesis. A synthesis of all the criteria in the previous four sections.

II. COLLECTION OF DATA FOR EARLY CHILDHOOD EDUCATION EVALUATION. In this section the sources, instruments, sampling procedures, and schedule for the data collection will be specified.

A. Sources of program effort data. Sources of evaluation data will be specified according to program effort, performance, performance pervasiveness, efficiency, and synthesis.

1. Under program effort data sources are organized according to installation, operation, and maintenance.

a. Installation. Data sources for installation are: Mr. Roy Alford, Dr. Robert Childers, Dr. William Bost, Mr. Don Nelson, Dr. Benjamin Carmichael, Mr. Robert Kennedy, and Mr. Jack Conrad.

b. Operation. Data sources for operation are: Mr. Roy Alford, Mr. Jack Conrad, and Dr. Robert Childers.

c. Maintenance. Same as previous section.

2. For program performance there are five sections of data sources. They are:
   a. Student performance. Children five years of age and under on September 30, 1968.
   b. Parent performance. Parents of children enrolled in program.
   c. Paraprofessional performance. The home visitation team.
   d. Mobile classroom teacher.
   e. School superintendents, assistant superintendents, principals, vice principals, and teachers in the districts where the program is operating.

3. Program performance pervasiveness. The data sources for this category will be Mr. Roy Alford, Mr. Kee Chang, Dr. Robert Childers, Director of Statistical Services of the West Virginia State Department of Education, and the Director of Census for the State of West Virginia.

4. Program efficiency. The data sources for this category will be the same as those in Nos. 1, 2, and 3 above.
5. Program synthesis. Data sources for this category will be the previous four categories.

B. Data collection instruments. Instruments are defined as tests, questionnaires, interviews, budget subcontracts, service agreements, memoranda and other documents from which data may be obtained for answering the questions posed in Section I.

1. Program effort. Data instruments will be organized according to Installation, Operation, and Maintenance.
   a. Installation. Instruments will be identified with the installation questions.
      1) AEL Early Childhood Education budget, subcontracts, service agreements, and invoices pertaining to purchasing of equipment for the program.
      2) Same as Number 1.
      3) Specifications for a central facility, subcontracts and service agreements.
      4) Subcontracts, and agreements with local agencies will service as the instruments for data collection.
      5) Program plan, memoranda and structured interviews.
      6) AEL budget, service agreements and memoranda.
      7) Interview with Dr. Benjamin Carmichael and Mr. Robert Kennedy.

   b. Operation. Interviews with Mr. Roy Alford, Mr. Jack Conrad and Dr. Robert Childers.
   c. Maintenance. Interviews with the same people identified under Section b.

2. Program performance. Instruments will be organized according to students, parents, home visitors, and mobile classroom teacher performance.
   a. Student performance. Seven different instruments will be used for student performance.
      1) Attitudinal checklist will be the instrument for the interest level.

2) Peabody Picture Vocabulary Test will be the data instrument for determining the intelligence.

3) The newest edition of the Illinois Test of Psycholinguistic Ability and the latest version of the Frostig Developmental Test of Visual Perception will be the instruments used to determine the status of language development.

4) T-unit analysis as described in a monograph by Norris, O'Donnell and Griffin will be the instrument used to determine the growth of language development.

5) A 70-item curriculum specific test[1] developed from a list of 70 behavioral objectives will be used as the instrument for determining the number of behavioral objectives correctly achieved.

6) Weekly anecdotal records will be the instruments used for determining favorable and unfavorable comments by paraprofessionals.

7) Same instrument as in No. 6

8) Same instrument as in No. 4.

b. Parent performance. An attitudinal checklist for questions 1, 4, and 5 and a questionnaire for questions 2, 3, and 6.

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[1]This test being developed by Dr. Robert Childers, Dr. James Ranson, and Mr. Roy Alford, Jr., all from AEL, with the assistance of Dr. Ray Norris from George Peabody College, Dr. Frank Hooper from West Virginia University, and Dr. John Kennedy from the University of Tennessee.

c. Paraprofessional learning. A sixteen question attitudinal questionnaire for questions 1, 3, and 4 and anecdotal records for question No. 2.

d. Mobile classroom teacher. A ten question attitudinal questionnaire for questions 1, 3, and 4, and a 20-minute interview for question No. 2.

3. Program performance pervasiveness. Interviews, letters, local and regional census reports, will be the instruments used to answer questions 'a' through 'g' under program performance pervasiveness.

4. Program efficiency. Interview will be the instrument for program efficiency.

5. Program synthesis. A seminar of the decision-makers will be the vehicle used to gather data for the program synthesis.

C. Sampling for data gathering. Sampling will only be required for the program performance category.

1. Student performance. A sample of 96 subjects stratified according to sex, age and treatment groups is the sampling plan.

Geographical characteristics made it necessary to work with clusters[2] of children in selected areas. The cluster areas

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[2]W. Allen Wallis and Harry V. Roberts, Statistics: A New Approach (Brooklyn: The Free Press, Inc., 1956), p. 489.

and sample were selected in the following way:[3]

Forty-one areas were identified according to the following criteria: (1) Within the viewing area of WOAY-TV, Channel 4, Oak Hill, West Virginia, (2) within a county whose local educational agency had agreed to participate in the study, (3) not within an incorporated village, town, or city, and (4) an access road leading into the area. West Virginia State Road Commission maps, marked in grids of four miles by five miles, were used in this process.

From the forty-one areas identified fifteen were randomly assigned to one of three treatment groups: T_1-television, home visits, traveling classroom; T_2-television and home visits; and T_3-television only.

On September 2, 1968, surveys were initiated to identify the preschool children within each of the fifteen selected areas.

In one of the areas it was learned that an ongoing kindergarten was in operation under a special grant. This area was discarded in favor of an adjacent one but outside the attendance area of the kindergarten.

From each treatment group, dispersed through its designated five areas, a random sample of twenty-four subjects stratified by three age levels (three, four, and five) and two sex levels (male and female) was selected.

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[3]This section was written by Mr. Roy Alford and is a part of a dissertation prospectus submitted to the University of Virginia School of Education.

Giles County, Virginia, was selected as a site for the control area. It lies outside the viewing area of WOAY-TV and does not have kindergarten classes in its rural areas. From a school census report a random sample of twenty-four subjects, stratified to the three age levels and two sex levels, was selected for the control (T_4) group (See Appendix A).

For each of the two subsequent years a new sample of three year old children will be selected for the program. During the same period a new group will be entering the first grade in their respective localities. Only one group will have participated for three years during the project, the three year olds enrolled September, 1968. (See Appendix C for the design)

2. Parent performance. Random sample of parents stratified according to treatment group, and three levels of socio-economic status, will be the sampling plan.

3. Paraprofessional performance - N/A

4. N/A

5. N/A

D. Schedule of data collection. All of the data are tentatively scheduled to be in office of the Director of Research on June 16, 1969.

III. ORGANIZATION OF THE DATA.

The data will be organized according to the organization of the questions in Section I of this document. Specific procedures

for storing and retrieving this information are the responsibility of Mr. Kee Chang, Director of Information for the Laboratory.

IV. ANALYSIS OF THE DATA.

In this section the statistical techniques used to analyze the data will be outlined according to the questions asked in Section I.

A. Effort. Descriptive statistics using graphs and narrative reports in content analysis of technical documents will be the analytical techniques for program effort.

B. Performance. Analysis of variance, (See Appendix A), chi square and descriptive statistics will be the analytical techniques for program performance.

C. Performance pervasiveness. Descriptive statistics will be used to analyze the data in this category.

D. Program efficiency. Ratio of statistics will be the analytical techniques for analyzing the data in this category.

E. Program synthesis. Content analysis of the data from the previous four sections will be the technique used for this category.

V. REPORTING OF INFORMATION.

At this time reports are scheduled for:

1. AEL Board of Directors.
2. Personnel within Division of Educational Laboratories.
3. The State Department of Education within the region.

4. Other educational laboratories.

5. ERIC.

The format of the report will be essentially the same as the annual Contractor's Request. Expected date of completion and submission of the report is September 15, 1969.

VI. MANAGEMENT.

The management of this evaluation will be under the Director of Research and Evaluation of AEL. Tools used for management are "PERTING" and budgeting.

APPENDIX A

		Television and Home Visitation and Traveling Classroom	Television and Home Visitation	Television	Control	
3	M	4	4	4	4	
	F	4	4	4	4	16
4	M	4	4	4	4	16
	F	4	4	4	4	16
5	M	4	4	4	4	16
	F	4	4	4	4	16
		24	24	24	24	96

Sampling Plan for 3, 4, and 5 Year Old Children

. DESIGN CONSIDERATIONS FOR THE ECE PROJECT

Introduction

The following constitutes a brief outline of major sources of variances that can be examined in relation to various phases of the ECE evaluation strategy. Two temporal contexts are considered. Specifically, attention is directed first toward an assessment of various dependent variables for the first years (1968-69) operation and then, consideration is given to the analysis of data for the three year project period. It is understood that the presented skeletal designs are subject to change especially during the first year, or pilot stage, of the project.

A decision was reached to attempt to control, or account for, six principal variables at various stages of the analysis. These variables are:

variable	levels	remarks
1. treatments (T) (TV, TV + PP etc.)	4	between Ss
2. age (A)	3	between Ss
3. sex (X)	2	between Ss
4. pre-post testing (P)	2	repeated over Ss
5. replications (R)	3	repeated over Ss for the 3 year period
6. groups (?)	?	application for analysis of several of the social tasks

Pilot Year Designs

A 4x3x2x2 mixed design will serve during the first year for the analysis of dependent variables in situations where pretest and posttest data is available. Specifically, such a design could be employed for analyzing data generated by the Frostig, ITPA and PPVT etc. A graphic layout of this design is presented in Figure 1 (see Figure 1). The source of variances associated with this design are listed below:

Three Between and One within Mixed Design[a]

Source	df
Total	192[b]
Between Ss	95
T	3
A	2
X	1
TA	6
TX	3
AX	2
TAX	6
Ss/TAX[c]	72
Within Ss	96
P	1
PT	3
PA	2
PX	1
PTA	6
PTX	3
PAX	2
PTAX	6
PS/TAX	72

[a]The four principal main effects are assumed to be fixed.

[b]Total df are based on the assumption that there will be four Ss per TAX combination.

[c]The slash mark, "/", denotes "nested within."

Valid F-tests for the above design are:

(1) T, A, X, TA, TX, AX, TAX against Ss/TAX

(2) P, PT, PA, PX, PTA, PAX, PTAX against PS/TAX

Sums of squares formuli can be mechanically derived from the degrees of freedom. Incidentally, the ANOVAR program (an in-house program) at the University of Tennessee will take care of all the mechanics if you string out the above listed sources of variance in the form of a model.

In addition, as suggested by Dr. Palmer, it would be most desirable to administer posttests to an additional randomly selected sample for the purpose of estimating the magnitude of effect due to pretesting - treatment interaction. This procedure is known as the Solomon four-group design and is discussed in the Campbell-Stanley chapter in Gage. If it is not feasible to posttest 96 Ss, then 48 Ss should be used. If the results of this nonorthogonal analysis should suggest a significant effect attributable to pretesting-treatment interaction, then this source of variance should be considered in subsequent designs.

Since data relevant to the majority of social, cognitive and language development tasks will be generated solely from posttests during the pilot phase, a simplier version of the design depicted above can be utilized. Specifically, the pretest-posttest variable can be ignored resulting in a simple 4x3x2 factorial.

Undoubtedly, there will be some social tasks in which a group effect must be entertained. This would apply, for example, in a situation where measures of social cooperation were recorded. During the first year, only posttest measures will be available, therefore,

incorporating a group main effect into the standard 4x3x2 design structure will permit an assessment of group effects. A diagram of the data matrix is contained in Figure 2. If a significant group effect should materialize, then the use of the group as the basic unit of measurement should be seriously considered. A listing of sources of variance for this hierarchical design is presented below:

Hierarchical Design

Source	df
Total	95
Between Gs	7[a]
T	3
G/T	4
Within Gs	88
A	2
TA	6
GA/T	8
X	1
TX	3
GX/T	4
AX	2
TAX	6
GAX/T	8
S/GAX/T	48

Valid F-tests for the above design are:

(1) T against G/T

(2) A, TA, against GA/T

[a]This is based on the assumption that a group is composed of 12 students.

(3) X, TX, against GX/T

(4) AX, TAX, against GAX/T

(5) G/T, GA/T, GX/T, GAX/T against S/GAX/T

There are some problems with this design the most obvious being the limited number of df in the denominator with which to test the T main effect. This can be remedied by increasing the number of groups nested within levels of T. However, this would necessitate employing either A or X as a between groups variable (a group of 6 that are all "homosexual"--ha .. ha--or a group of 6 that are all one age) if sample size is to remain constant. Another alternative would be to eliminate A or X as an incorporated variable. Let's hold off on this decision until we have a little more information about the nature of these social tasks.

Total Project Design

The important consideration for the total design is that orthogonal comparisons will be made only within generations, i.e., a group (n = 96) that begins the program at the same time during the same year. Between generation comparisons will necessitate nonindependent comparisons.

For a given generation, the overall design is similar to the 4x3x2x2 mixed design discussed initially except that an additional variable, replications over the three years (R), is added. Thus, we have a three between Ss and a two within Ss design. Assuming only for the ~~(movement)~~ moment no attrition, the sources of variance would be:

Three Between - Two Within

Source	df
Total	575
Between Ss	95
T	3
A	2
X	1
TA	6
TX	3
AX	2
TAX	6
Ss/TAX	72
Within Ss	480
P	1
PT	3
PA	2
PX	1
PTA	6
PTX	3
PAX	2
PTAX	6
SsP/TAX	72
R	2
RT	6
RA	4
RX	2
RTA	12
RTX	6
RAX	4
RTAX	12
SR/TAX	144
PR	2
PRT	6
PRA	4
PRX	2
PRTA	12
PRTX	6
PRAX	4
PRTAX	12
SsPR/TAX	144

Valid F-tests are:

(1) T, A, X, TA, TX, AX, TAX against Ss/TAX

(2) P, PT, PA, PX, PTA, PTX, PAX, PTAX against SsP/TAX

(3) R, RT, RA, RX, RTA, TRX, RAX, RTAX against SR/TAX

(4) PR, PRT, PRA, PRX, PRTA, PRTX, PRAX, PRTAX against SsPR/TAX.

			P_1	P_2
T_1	A_1	X_1	S_{1111}	S_{1121}
			S_{1114}	S_{1124}
		X_2	$(n=4)$	
	A_2	X_1	$(n=4)$	
		X_2	"	
	A_3	X_1	"	
		X_2	"	
⋮				
T_4	A_1	X_1		
		X_2		
	A_2	X_1		
		X_2		
	A_3	X_1		
		X_2		

Fig. 1. Layout of Three Between-One Within Ss Design.

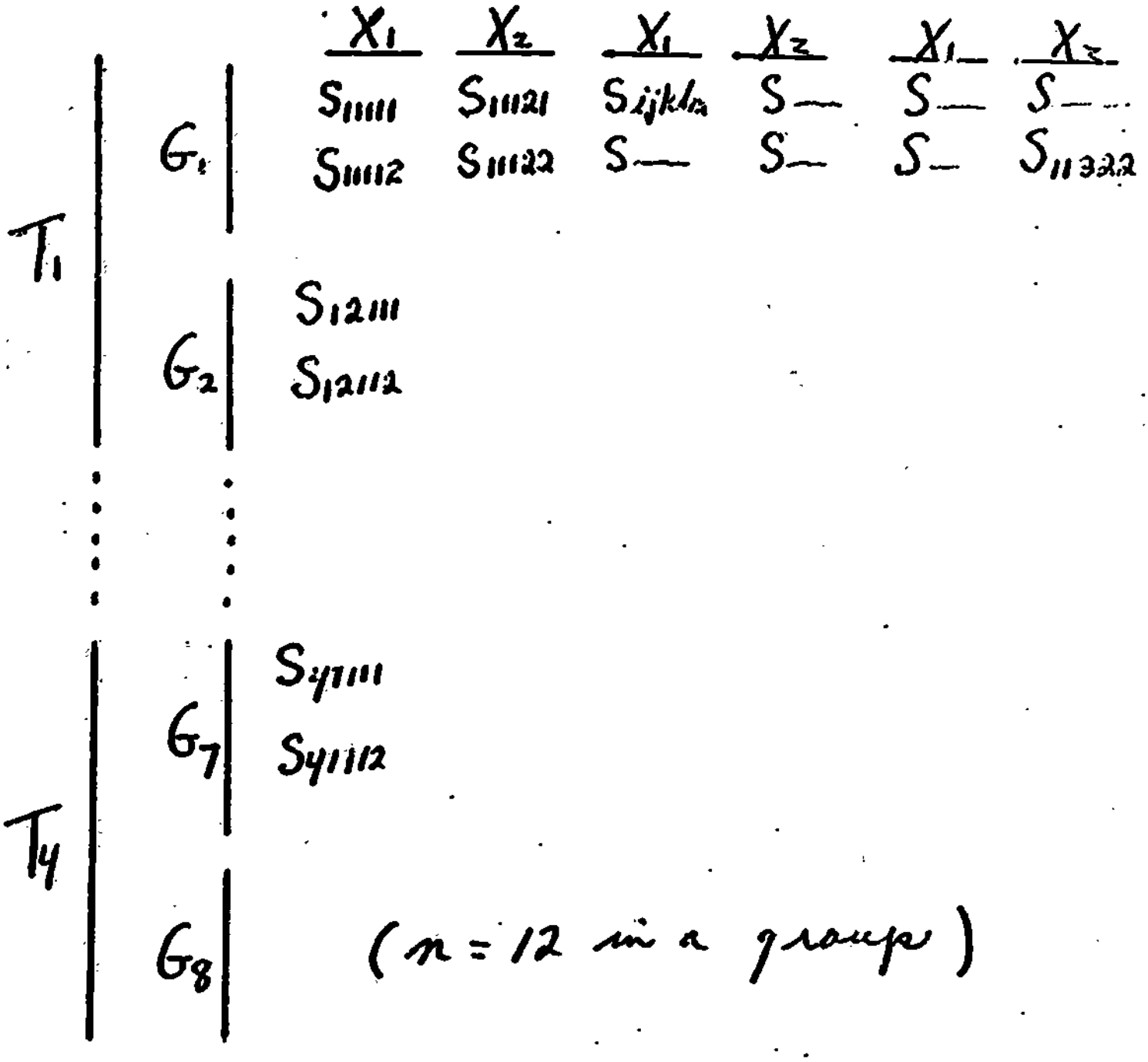

Fig. 2. Layout of Hierarchical Design where groups are nested within treatments, and age and sex are within group variables.

APPENDIX B

	Television and Home Visitation and Traveling Classroom	Television and Home Visitation	Television	Control	
Hi	5	5	5	5	20
Medium	5	5	5	5	20
Low	5	5	5	5	20
	15	15	15	15	60

Sampling Plan for Parents in ECE Evaluation

APPENDIX C

SAMPLING DESIGN FOR 3 YEAR PERIOD

Enrollment Date for 3, 4, & 5 Year Old Children

Age at Start of Project	September 1968	September 1969	September 1970	September 1971
0				
1			X	
2		X	X	
3	X	X	X	enter 1st grade
4	X	X	enter 1st grade	enter 2nd grade
5	X	enter 1st grade	enter 2nd grade	enter 3rd grade

1 year operation

2 year operation

3 year operation

APPENDIX B

ANALYSIS OF INTEREST LEVEL OF PRESCHOOL CHILDREN IN AEL-ECE PROJECT

Analysis of Children and Parental Interest

One important phase of the evaluation was to determine whether or not the Early Childhood program could maintain the interest of the children and parents participating in the program. This information was considered to be important since the assumption was made that the children should learn from the program and that they should enjoy learning. Since the parents were an important part of the children's learning process, it was felt that readings on their interest should be obtained.

Interest and attitude were used synonymously, and were theoretically defined as the strength of feeling a child or parent held concerning the television programs at a particular time. Attention span of the child, amount of time the child watched the program and the general cooperativeness of the child were assumed to be criteria of interest. Cooperativeness and enthusiasm were criteria for parental interest.

The instrument used to gather the data for child and parent interest and attitude was a six question checklist. The first two questions had a seven point scale, and they were directed to the parents. The third and fourth questions had two seven point scales each and they were directed to the parents. The fifth question had three seven point scales and it was directed to the children. The seventh question on the instrument pertained to the quality of TV reception. (See Appendix J for a copy of the checklist.)

The operational definition was the percentage of tallies recorded in the most favorable categories of the seven point scales. The variance was not generated from the percentage of tallies across the seven point scales for each question, but it was generated from the percentage of tallies in the most favorable categories for each question across the thirty-two weeks that the data were collected.

One of the problems with using this instrument was the bias inherent in gathering the data. The home visitors were used to gather the data and they were also an integral part of the program. It was reasonable to expect that they would be biased in favor of the program. A second difficult problem was the difficulty the home visitors experienced in discriminating between the bi-polar adjectives.

From a cursory glance at the tallies on the checklists during the early part of the year it was evident that the bias was clearly in favor of the program. For the entire year 78 percent of the responses were in the most favorable categories. However, it was reasonable to expect that bias accounted for only part of the fact that most tallies were in the most favorable category and that the program did have some true effect in maintaining a high level of interest.

One question with three scales (Question VI) pertained directly to the interest level of the children. The procedures for achieving the measure of interest from these three scales were somewhat complicated. The home visitor recorded her impression on the checklist after she had visited the home. She recorded her impressions on all six questions of the checklist.

The recorded checklists were subsequently turned over to the research division. At that time the number of raw tallies for each of the seven points for each scale were converted to percentages. The percentages were obtained by dividing the total number of responses for each scale into the number of responses for each point along that scale. As discussed above one question with three seven point scales was used for assessing the children's interest. The mean percentage of responses in the most favorable category in these three scales was used as the measure of pupil interest for study.

Table I contains the mean percentages of tallies recorded on point 1 of the scales (the most favorable category) for each week during which measures

were taken. The first measures were taken during the week of October 3, 1968 and the last measures were taken the week of May 21, 1969. In all measures were taken for twenty five weeks during the first year's operation.

The checklist contained five questions pertaining to parental attitude and one question pertaining to the child. The mean percentage of tallies recorded in point one on the scales for parents during the year was .763 and for the children it was .653. The correlation between the percentage of tallies for parents and for students during the year was 0.87. Thus seventy-six percent of the variance in parental interest was common with the variance in pupil interest. This common variance was expected since the observers recorded their impressions of the parents and the children at the same time. One significant finding was the difference of 0.11 percentage points in favor of the parents over the children.

The t-test for correlated means was 15.25. So it was reasonable to conclude that the difference between the two was a true difference. Both the correlation and the difference is graphically depicted in Figure 1.

Another significant finding was the difference in degree that the parental interest and the children's interest declined. The parental interest declined 0.116 mean percentage points and the children's interest declined 0.090 mean percentage points. The parental interest declining more than the children's interest could have been due to the "halo effect" wearing off. It was reasonable to conclude that parents would have been more sensitive to the newness of the program than the children.

From these data it was reasonable to conclude (1) that the Early Childhood Education program did instill and maintain a high level of interest for both the parents and the children, and (2) that the parents had and maintained a higher level of interest in the program than did the children. A possible source of concern from these conclusions was that the high parental interest

in the program could possibly have a reactive effect on the children. In other words, there was a danger that the parents could force the children to participate and thereby contribute to a child "dropping out of school" before he even started.

Table I

Attitude Check list Survey (ACS)

The numbers recorded in the table below represent the percentage responding at the most extreme positive level on the differential scale for a given category. The item given is for the cumulative total for the week ending on date in the left column. Sample survey sheet is on next page.

Week Ending	Questions					
Date	I&II	IV	V	I,II,III IV&V	VI	VII
10/3	.851	.783	.774	.778	.743	.863
10/10	.846	.753	.714	.747	.697	.928
10/17	.856	.739	.788	.745	.673	.819
10/24	.906	.796	.798	.805	.757	.900
10/31	.906	.781	.849	.813	.703	.827
11/6	.916	.801	.860	.847	.745	.876
11/13	.942	.812	.865	.846	.762	.856
11/20	.913	.766	.802	.784	.673	.815
12/4	.886	.644	.663	.692	.580	.608
12/11	.898	.653	.785	.738	.611	.870
12/20	.923	.709	.885	.773	.626	.899
1/9	.902	.677	.783	.774	.599	.896
1/15	.950	.774	.813	.790	.718	.930
1/30	.926	.810	.922	.813	.679	.916
2/6	.928	.772	.870	.792	.705	.909
2/13	.945	.828	.944	.842	.668	.889
2/19	.902	.763	.832	.769	.653	.910
2/26	.881	.775	.804	.822	.704	.863
3/12	.890	.708	.833	.756	.624	.837
3/25	.913	.761	.834	.756	.668	.725
4/16	.875	.692	.732	.710	.621	.882
4/23	.919	.718	.786	.752	.617	.865
5/2	.667	.614	.614	.597	.452	.851
5/12	.879	.719	.777	.719	.568	.885
5/21	.850	.644	.716	.662	.529	.827
Mean	.871	.739	.803	.763	.653	.853
SD	.053	.057	.072	.057	.073	.071

I & II	Parent Attitude to ECE Program
IV	Parent Attitude to TV
V	Parent Attitude to Materials
I,II,III,IV,V	Parent Total Attitude
VI	Child Attitude to TV Lesson
VII	TV Reception

Parent Combined Attitude from ACS .400 to 1.000 scale on left
Child Attitude from ACS .400 to 1.000 scale on left
Positive/Negative Comment Ratio 0.0 to 8.0 scale on right

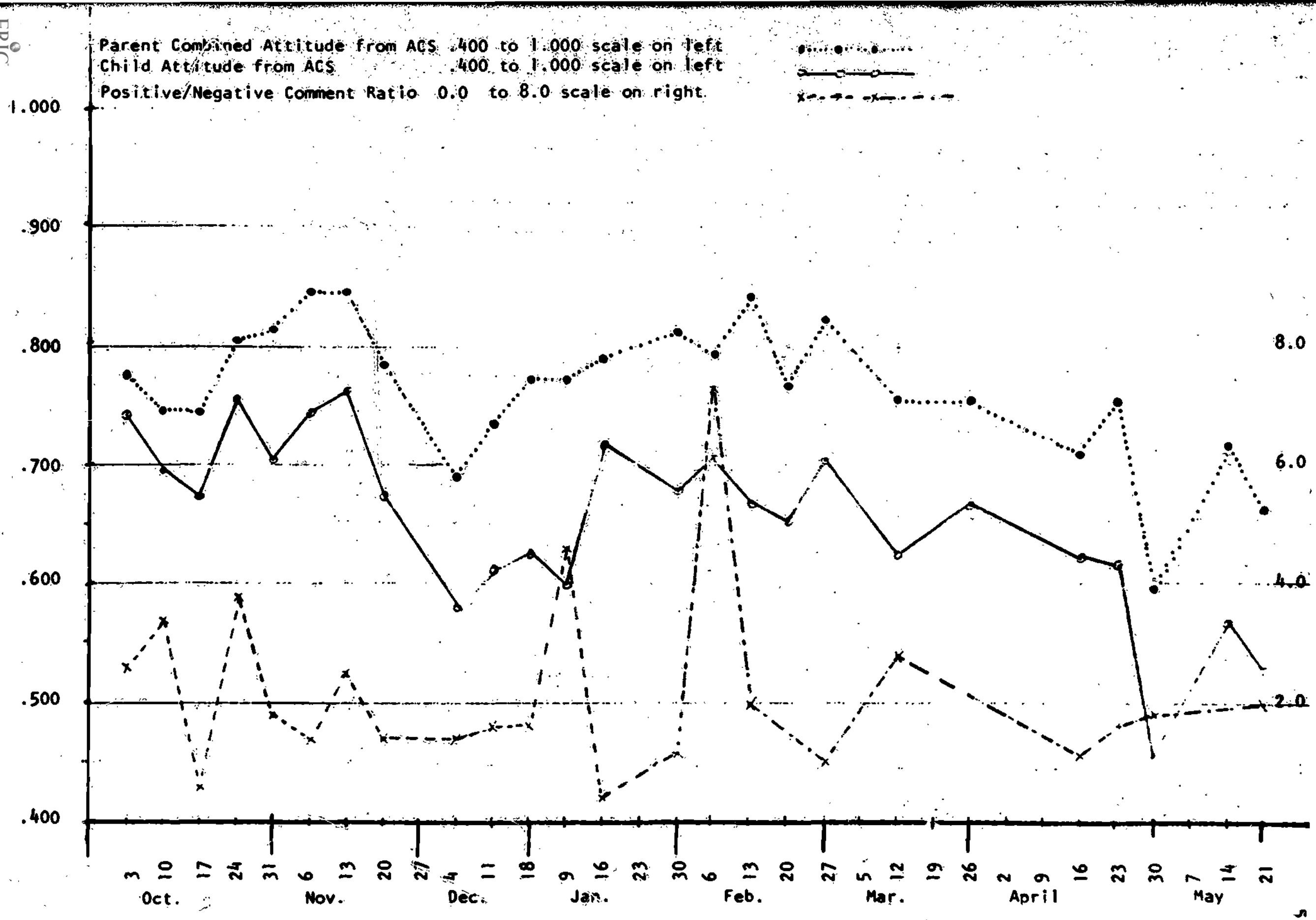

Figure 1

APPENDIX C

ANALYSIS OF IQ GAIN OF ECE CHILDREN

Analysis of IQ Gain of Preschool Children

In the ECE curriculum, intelligence was placed in the same category as cognition. However, for purposes of evaluation it was broken out separately. The mean gain raw scores and mean gain IQ score and the respective gain standard deviations are included in Table I. The highest IQ gain, 19.25, was experienced by the three year old female in the control group. The mean raw score gain was 21 and the gain standard deviation was 13.04. The four year old males in the van group experienced the least IQ gain, -3.00, with a negative mean raw score gain of 1.6 and standard deviation of 33.39. Although this is a large range, statistical analyses performed, which will be discussed subsequently, indicated no significant differences.

Table II presents the summary of the analysis of covariance of the Peabody Picture Vocabulary Test scores using the pretest scores as the covariate, and the post-test scores as the variate and controlling for age and sex. There was one provocative F-ratio and that was the age by sex interaction.

No hypotheses have been advanced to explain why this might occur. Figure I graphically depicts this age by sex interaction. At three years of age the gain is the same. At four years of age the male subjects have a higher gain than the female subjects, and at five years of age the female subjects have a higher gain than the male subjects. It is difficult to explain why the disparity occurs between three and four years of age, and subsequently this disparity reverses itself from four to five years of age. One explanation is that this disparity is an artifact of the testing situa-

tion. That is, as the children get progressively older they react differently to the testing situation. At three years of age it makes no difference; at four years of age it could be that the male subjects are less sensitive to the situation and the female subjects are; and at five years of age this situation could be reversed. A second explanation is that this represents a true picture of child growth and development, whatever the reasons may be. Many other explanations are also plausible. Since this interaction has been observed in a number of different sets of data, it probably is worthy of further investigation.

TABLE I

GAIN IQ SCORES BY TREATMENT, AGE AND SEX AS DERIVED FROM PPVT RAW SCORES

Age	Sex		1 TV+PP+VAN	2 TV+PP	3 TV	4 CONTROL
3	M	Mean	3.50	15.75	12.75	1.00
		S.D.	20.66	21.55	17.09	14.65
	F		8.83	-1.83	2.00	19.25
			16.09	13.26	23.26	16.82
4	M		13.60	12.67	2.00	4.25
			11.06	20.60	22.02	4.79
	F		-3.00	6.25	0.00	4.60
			22.57	13.45	5.10	16.77
5	M		22.40	4.25	4.00	8.00
			16.50	12.18	18.17	8.28
	F		10.83	24.00	9.75	33.25
			13.93	17.21	13.82	19.24

RAW SCORE MEAN GAINS AND STANDARD DEVIATIONS OF PEABODY PICTURE VOCABULARY BY TREATMENT, AGE AND SEX

Age	Sex	1 TV+PP+VAN	2 TV+PP	3 TV	4 CONTROL
3	M	7.33	16.25	14.75	6.00
		14.72	13.65	11.30	8.91
	F	14.83	7.17	10.00	21.00
		8.31	6.97	13.81	13.04
4	M	15.60	11.67	3.00	4.00
		5.73	11.72	14.31	1.63
	F	2.00	7.00	4.80	7.80
		12.75	8.08	2.95	7.73
5	M	-1.60	3.50	4.00	7.40
		33.39	5.07	7.58	6.62
	F	8.33	14.50	7.50	19.25
		7.10	11.36	4.66	9.32
		4.97	10.01	7.34	10.90

TABLE II

ANALYSIS OF COVARIANCE OF SUMMARY TABLE FOR PEABODY PICTURE VOCABULARY RAW TEST SCORES WITH PRETEST SCORES AS COVARIATE AND POST-TEST SCORES AS VARIATE

	Sum of Square	df	MS	F
Treatment	131.00	3	43.6	0.42
Age	270.00	2	135.0	1.30
Sex	97.50	1	97.5	0.94
Treatment x Age	567.00	6	94.4	0.91
Treatment x Sex	599.00	3	200.0	1.93
Age x Sex	585.00	2	293.0	2.83
Treatment x Age x Sex	513.00	6	85.5	0.83
Within	8902.49	86	103.5	

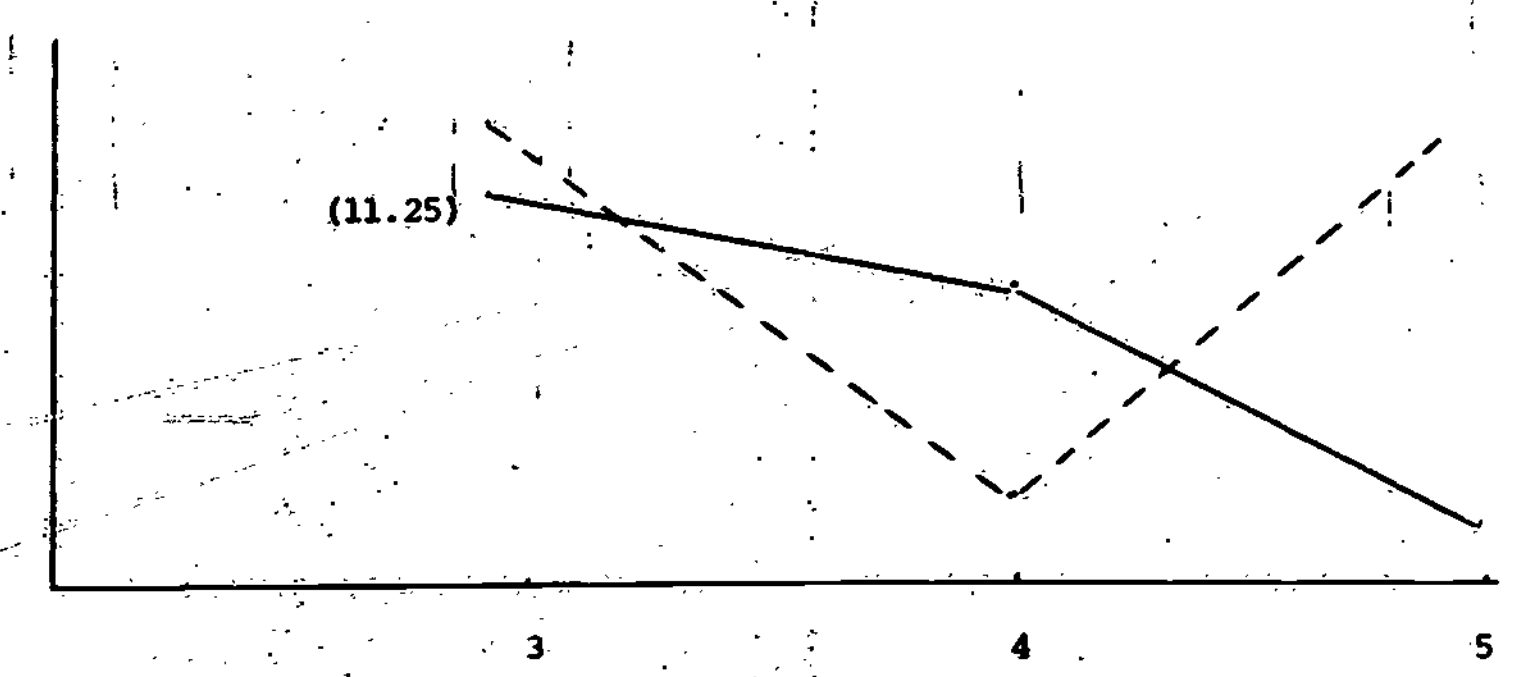

Figure 1

Graphic Depiction of Age by Sex Interaction of PPVT Raw Gain Scores

APPENDIX D

DETAILED ANALYSIS OF LANGUAGE DEVELOPMENT OF PRESCHOOL CHILDREN IN ECE PROGRAM

Introduction

Originally the objectives for the early childhood education program were divided into four major categories--motor activities, language skills, cognition, and orienting and attending skills.[1] This report was concerned with the language skills category of objectives.

One of the difficulties associated with evaluating language skills was the loose fit between available theoretical definitions of language and operational definitions of language. Often language is not theoretically defined at all, and must be inferred from the operational definition which is the measure being used. The procedure of inferring the theoretical definition from the measure being used often creates a biased fit between theory and operation and more specifically often creates a problem of test relevancy.

For the first year's early childhood operation the theoretical definition was implied from the instrument used to measure language--The Illinois Test of Psycholinguistic Abilities (ITPA). The definition of language, therefore, was the definition used by the authors of the ITPA.

The decision for using the ITPA was justified on the basis that it was used as a primary instrument in gathering data for the development of the early childhood curriculum objectives.[2] The decision assumed that the objectives of the early childhood curriculum were directly influenced by this instrument, and that this was a reasonable justification concerning the relevancy of the ITPA to objectives around which the early childhood education

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[1] Frank H. Hooper and William H. Marshall, The Initial Phase of a Preschool Curriculum Development Project (Charleston: Research and Information Center, 1968) p. 99.

[2] Ibid. pp. 76-89.

programs were developed.

The remainder of the report is organized according to the model underlying The Illinois Test of Psycholinguistic Abilities, the presentation of the data, and a discussion of the results.

The Model of the ITPA

According to the authors of the ITPA, the theory underlying the test is:

> To relate those functions whereby the intentions of one individual are transmitted (verbally or nonverbally) to another individual, and, reciprocally, functions whereby the environment or the intentions of another individual are received and interpreted. It attempts to interrelate the processes which take place, for example, when one person receives a message, interprets it, or becomes a source of a new signal to be transmitted. It deals with the psychological functions of the individual which operate in communication activities.[3]

For the early childhood education, functions were transmitted by television, by paraprofessionals visiting the homes, and by a professional teacher in a van. The receivers of the communication were the three, four, and five year old children. This, briefly, was the rationale for using the ITPA as a measure for language development in the AEL-ECE program.

Upon examining the objectives that were used in the curriculum during the first year, and comparing those with the test items in the ITPA, only Subtest V of the ITPA was found to be directly related to those objectives.

Figure 1 depicts the gain scores achieved on each of the subtests according to the four groups in the study.

Three-way analysis of variance on the gain scores was the statistical analysis used. The factors in the analysis were four levels of treatment, three levels of age, and two levels of sex. The four levels of treatment were the television plus paraprofessional plus the van, television plus

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[3]Samuel A. Kirk, James J. McCarthy, and Winifred D. Kirk, Examiners Manual Illinois Test of Psycholinguistic Abilities, (Urbana: The Board of Trustees of the University of Illinois, 1968.

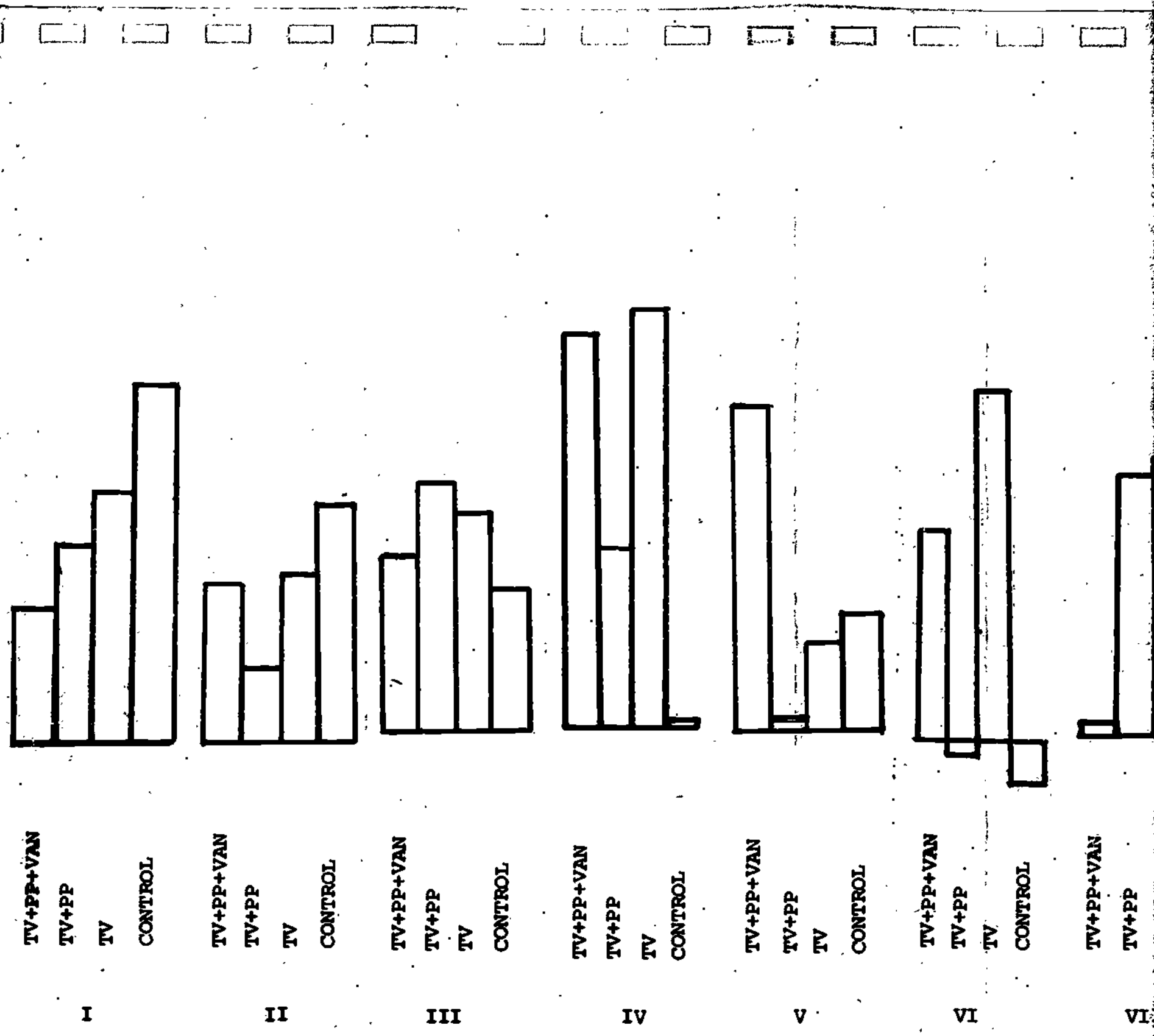

FIGURE 1

Graphic Depiction of Illinois Test of Psycholinguistic

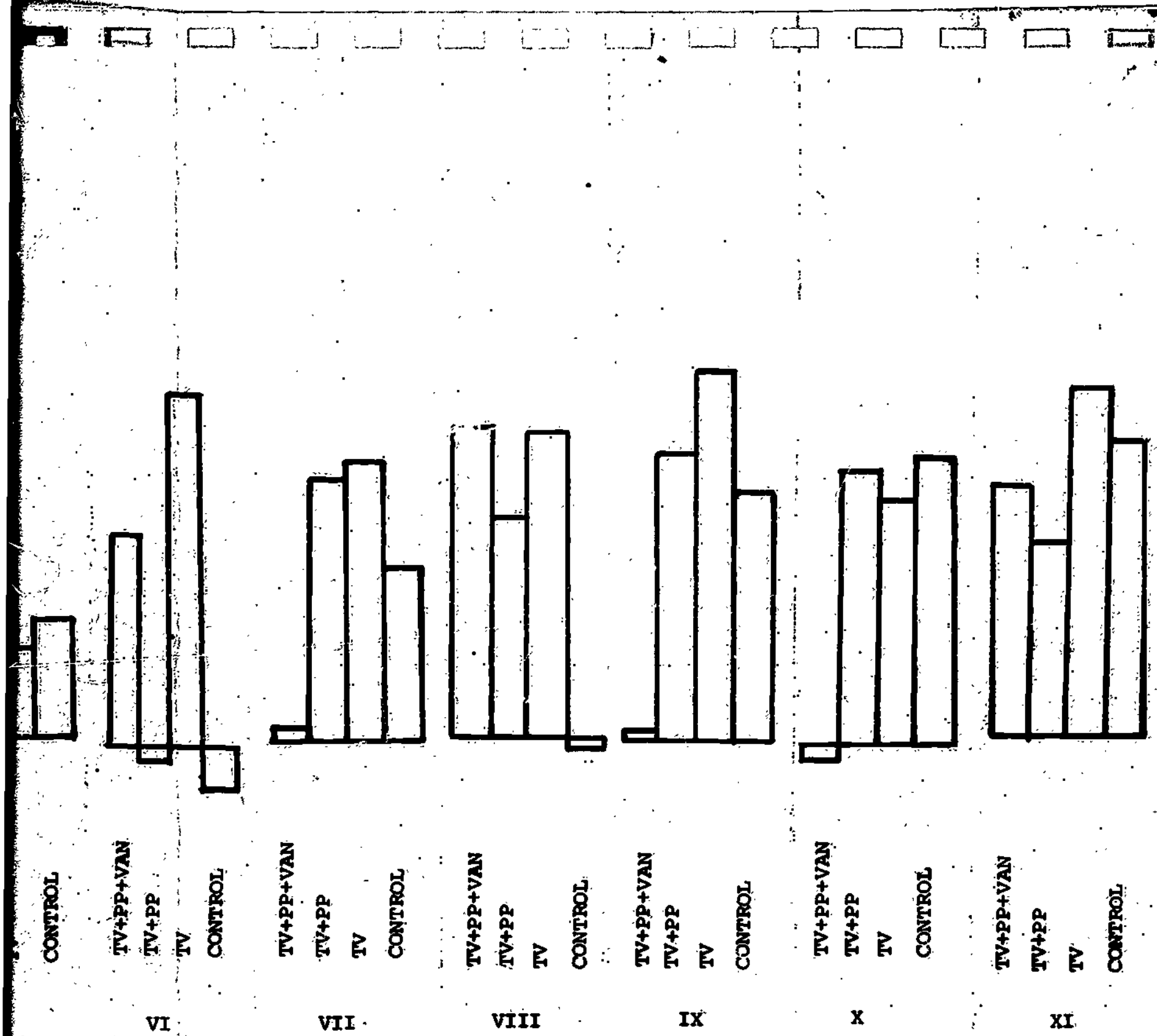

FIGURE 1

is Test of Psycholinguistic Abilities Gain Scores

paraprofessional, television, and zero control. The three levels of age were three, four and five year olds. The two levels of sex were male and female. Analyses were conducted on each of the ten subtests and the total test.

ITPA Subtest One, Auditory Reception

Auditory reception measures the ability of a child to derive meaning from verbally presented material. Since the receptive rather than the expressive process is being sampled, the response throughout is kept at the simple level of a "yes" or "no" or even a nod or shake of the head. The vocabulary becomes more and more difficult while the response remains at a two-year level. Similarly, the automatic function of determining meaning from syntax has been minimized by retaining only one sentence form. The test contains 50 short, direct questions printed in the manual. Typical items are: "Do dogs eat?" "Do dials yawn?" "Do carpenters kneel?" "Do wingless birds soar?"[4]

For the ITPA Subtest One, the analysis of variance on the gain scores produced a treatment by age interaction significant at the .003 level. Figure 2 graphically illustrates the treatment by age by sex interaction. The interaction appears to be a phenomenon of differences in the control group and the remaining three groups as a unit. As expected from the analysis of mean gain scores, the three year olds, four year olds and five year olds achieve gains in ascending order with the exception of the control group, and there the three and five year olds reversed themselves on the mean gain scores.

Table I presents the summary table of the analysis of variance of the gain scores. Table II presents the means and standard deviations of the gain scores for the ITPA Subtest One by treatment, age, and sex.

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[4]Ibid, p. 9.

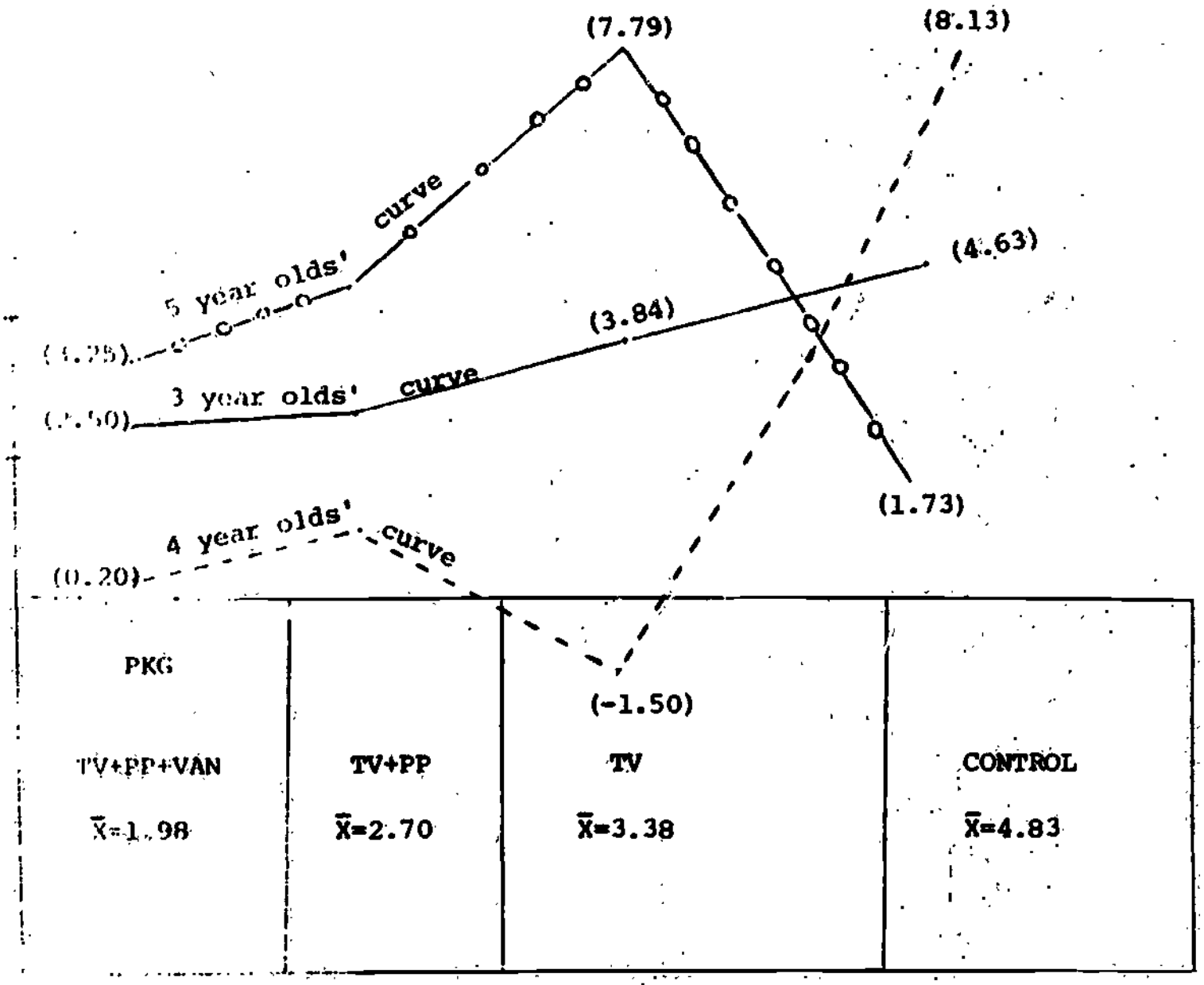

FIGURE 2

Graphic Depiction of Treatment by Age Interaction on ITPA Subtest One

TABLE I

SUMMARY TABLE FOR ANALYSIS OF VARIANCE OF GAIN SCORES FOR ITPA SUBTEST #1 (AUDITORY RECEPTION)

ANOVA

	Sum of Squares	Degrees of Freedom	Mean Square	F	P
T	110.25	3	36.75	1.47	0.23
A	104.90	2	52.45	2.10	0.13
S	63.55	1	63.55	2.53	0.12
TXA	552.66	6	89.11	3.60	0.003
TXS	69.06	3	23.02	0.92	
AXS	49.70	2	24.85	0.99	
TXAXS	135.18	6	22.53	0.90	
Error	2303.68	92	25.04		

TABLE II

MEANS AND STANDARD DEVIATIONS OF
PRETEST AND GAIN SCORES ON ITPA SUBTEST ONE
ACCORDING TO TREATMENT AGE AND SEX

AGE (Years)	SEX	Sta-tistic	TV+PP+VAN		TV+PP		TV		CONTROL	
			Pre	Gain	Pre	Gain	Pre	Gain	Pre	Gain
3	M	n	6	6	4	4	6	6	4	4
		$\bar{x}$	19.00	2.00	16.00	4.00	5.25	50	8.25	8.25
		SD	11.68	7.40	4.29	2.94	2.22	4.93	5.56	3.20
	F	n	6	6	6	6	6	6	4	4
		$\bar{x}$	19.17	3.00	14.16	1.33	11.67	2.17	16.00	1.00
		SD	9.26	3.63	5.77	4.03	3.45	3.43	6.98	2.71
4	M	n	5	5	5	5	5	5	4	4
		$\bar{x}$	18.20	2.40	18.00	1.67	18.50	1.00	18.25	9.25
		SD	4.55	4.98	2.00	5.69	2.38	5.48	9.95	3.78
	F	n	4	4	5	5	5	5	5	5
		$\bar{x}$	24.75	-2.00	19.20	0.40	19.80	-2.00	17.80	7.00
		SD	16.21	2.00	5.31	3.05	3.84	7.84	6.18	4.74
5	M	n	6	6	5	5	6	6	5	5
		$\bar{x}$	29.50	4.70	21.00	3.40	21.00	5.33	16.80	3.20
		SD	9.27	7.12	6.82	2.61	7.87	2.80	4.97	3.63
	F	n	6	6	5	5	4	4	4	4
		$\bar{x}$	19.33	2.00	19.00	5.40	17.00	10.25	32.25	0.25
		SD	11.08	6.93	7.35	2.07	2.58	8.88	8.58	6.40

ITPA Subtest Two, Visual Reception (Visual Decoding)

The visual reception test is comparable to the Auditory Reception Test but utilizes a different sense modality. It is a measure of the child's ability to gain meaning from visual symbols. In this test there are 40 picture items, each consisting of a stimulus picture on one page and four response pictures on a second page. The child is shown the stimulus picture for three seconds with the directions, "See This?" Then the page of response pictures is presented with the direction, "Find one here." The credited choice is the object or situation which is conceptually similar to the stimulus. The other choices include pictures with varying degrees of structural (rather than functional) similarity or pictures which are associated with the stimulus or with the acceptable choice.[5]

The analysis of variance of the gain scores yielded a treatment by age by sex interaction significant at the .09 level. Figure 3 graphically depicts the treatment by age by sex interaction. The interaction appears to be a phenomenon of differential variation in the performance of the four year old boys and girls across the treatment groups. In the television, paraprofessional and van group, the male and female four year olds gained approximately the same. In the television and paraprofessional group, the four year old males gained far more than the four year old females. In the television group, the four year old males and females gained the same, and in the control group the four year old males and females gained more than the four year old males. Table III presents the summary table for the analysis of variance of the gain scores. Table IV presents the means and standard deviations of the gain scores for ITPA Subtest Two according to

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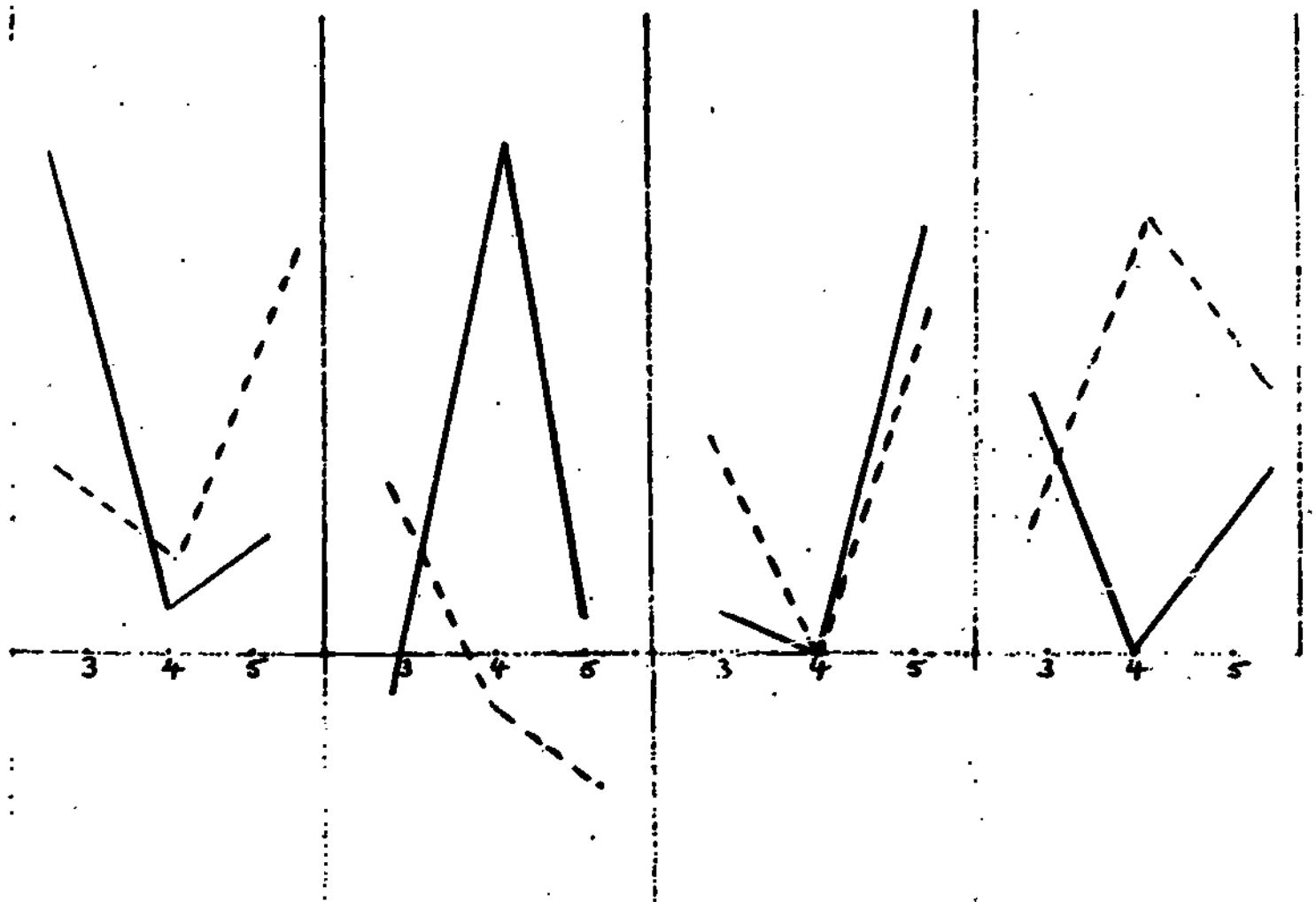
[5] Ibid, p. 10.

MALE_____

FEMALE------



TV+PP+VAN	TV+PP	TV	CONTROL
$\bar{X}$=2.12	$\bar{X}$=1.06	$\bar{X}$=2.25	$\bar{X}$=3.25

FIGURE 3

Graphic Illustration of Treatment
by Age by Sex Interaction of ITPA Subtest Two Gain Scores

TABLE III

SUMMARY TABLES FOR ANALYSIS OF VARIANCE OF GAIN SCORES AND AND ANALYSIS OF COVARIANCE OF GAIN SCORES USING PRETEST SCORES AS A COVARIATE FOR ITPA SUBTEST TWO

ANOVA

	Sum of Squares	Degrees of Freedom	Mean Square	F	
T	98.97	3	32.99	1.42	
A	32.48	2	16.24	0.70	
S	0.01	1	0.01	0.00	
TXA	201.78	6	33.63	1.45	
TXS	48.75	3	16.25	0.70	
AXS	3.06	2	1.53	0.07	
TXAXS	264.18	6	44.03	1.89	.09
Within	2138.08	92	23.24		

TABLE IV

MEANS AND STANDARD DEVIATIONS OF ITPA
SUBTEST TWO (VISUAL RECEPTION) PRETEST AND GAIN SCORES
BY TREATMENT, AGE AND SEX

AGE (Years)	SEX	Statistic	TV+PP+VAM		TV+PP		TV		CONTROL	
			Pre	Gain	Pre	Gain	Pre	Gain	Pre	Gain
3	M	n	6	6	4	4	6	6	4	4
		$\bar{x}$	12.67	6.50	11.00	-0.25	8.00	0.50	7.25	3.25
		SD	4.13	4.85	4.16	3.20	2.93	3.32	3.31	1.71
	F	n	6	6	6	6	6	6	4	4
		$\bar{x}$	13.67	2.50	7.50	2.17	7.50	2.83	10.00	1.75
		SD	6.71	3.78	1.52	2.04	3.39	4.71	1.41	2.36
4	M		5	5	5	5	5	5	4	4
			10.60	0.80	9.00	6.67	11.50	0.00	17.00	0.00
		SD	2.79	2.78	1.00	9.07	7.14	6.68	6.37	6.88
	F	n	4	4	5	5	5	5	5	5
		$\bar{x}$	19.50	1.25	14.10	-0.80	14.20	-0.00	9.80	5.80
		SD	11.09	4.11	2.92	3.90	7.40	5.79	1.79	4.76
5	M	n	6	6	5	5	6	6	5	5
		$\bar{x}$	23.67	1.50	15.20	0.40	14.50	5.67	10.80	2.60
		SD	6.71	3.27	4.97	5.94	5.61	4.80	5.26	4.34
	F	n	6	6	5	5	4	4	4	4
		$\bar{x}$	15.17	5.17	20.40	-1.80	17.50	4.50	19.75	3.25
		SD	9.67	3.66	7.50	9.31	1.95	4.93	9.54	4.03

treatment, age, and sex.

ITPA Subtest Three, Auditory-Vocal Association

This measure taps the child's ability to relate concepts presented orally. In this test the requirements of the auditory receptive process and the vocal expressive process are minimal, while the organizing process of manipulating linguistic symbols in a meaningful way is tested by verbal analogies of increasing difficulty. A sentence completion technique is used, presenting one statement followed by an incomplete analogous statement, and allowing the child to complete the second statement appropriately. There are 42 orally presented analogies, such as, "I cut with a saw; I pound with a _____." "A dog has hair; a fish has _____."[6]

The analysis of variance of the gain scores yielded a significant difference between the males and females at the .03 level. The mean gain for the males was 3.07 and the mean gain for the females was 2.05. TableV presents the summary table for the analysis of variance on the gain scores. Table VI presents the mean gain scores by treatment, age and sex for Subtest three.

ITPA Subtest Four (Visual-Motor Association)

The organizing process in this channel is tapped by a picture association test with which to assess the child's ability to relate concepts presented visually. The child is presented with a single stimulus picture surrounded by four optional pictures, one of which is associated with the stimulus picture. The child is asked, "What goes with this?" (pointing to the stimulus picture). "Which one of these?" (pointing to the four optional pictures). The child is to choose the one picture which is most closely related to the stimulus picture, such as a sock belonging with a shoe, or a

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[6]Ibid, p. 10.

TABLE V

SUMMARY TABLES FOR ANALYSIS OF VARIANCE OF GAIN SCORES AND ANALYSIS OF COVARIANCE OF GAIN SCORES USING PRETEST SCORES AS COVARIATE FOR ITPA SUBTEST THREE (AUDITORY VOCAL ASSOCIATION)

ANOVA

	Sum of Squares	Degrees of Freedom	Mean Square	F	P
T	39.66	3	13.22	0.81	
A	2.90	2	1.54	0.09	
S	156.29	1	156.29	4.68	0.03
TXA	176.10	6	29.35	1.80	
TXS	2.16	3	0.72	0.04	
AXS	4.16	2	2.08	0.13	
TXAXS	68.02	6	14.67	0.90	
Error	1502.91	92	16.34		

TABLE VI

MEANS AND STANDARD DEVIATIONS FOR ITPA SUBTEST THREE (AUDITORY VOCAL ASSOCIATION) PRETEST AND GAIN SCORES ACCORDING TO TREATMENT, AGE AND SEX

AGE (Years)	SEX	Statistic	TV+PP+VAN		TV+PP		TV		CONTROL	
			Pre	Gain	Pre	Gain	Pre	Gain	Pre	Gain
		n	6	6	4	4	6	6	4	4
	M	$\bar{x}$	11.00	1.50	11.25	3.50	5.25	4.00	7.50	3.75
3		SD	8.30	6.06	6.55	5.74	.96	2.94	3.31	3.40
		n	6	6	6	6	6	6	4	4
	F	$\bar{x}$	13.83	0.00	11.50	1.83	8.83	3.33	9.25	3.00
		SD	4.71	4.05	5.53	3.87	4.58	3.33	5.62	3.74
		n	5	5	5	5	5	5	4	4
	M	$\bar{x}$	10.20	4.60	15.00	0.33	12.75	3.50	15.75	2.50
4		SD	3.19	2.51	4.36	2.08	6.85	1.00	6.65	4.50
		n	4	4	5	5	5	5	5	5
	F	$\bar{x}$	16.00	0.50	16.40	3.40	14.80	2.60	13.60	2.80
		SD	12.19	3.87	1.82	2.51	4.97	3.78	4.62	3.03
		n	6	6	5	5	6	6	5	5
	M	$\bar{x}$	20.50	3.00	15.00	6.20	15.00	3.17	13.40	1.00
5		SD	8.74	4.10	6.00	5.36	4.94	3.97	2.07	2.91
		n	6	6	5	5	4	4	4	4
	F	$\bar{x}$	12.33	4.33	19.80	4.00	20.25	1.00	26.75	-2.25
		SD	7.74	3.50	4.44	7.78	.50	2.58	9.71	1.70

hammer with a nail. The test is expanded at the upper level to provide visual analogies comparable to the auditory analogies. "If this goes with this" (pointing to each of a preliminary pair of pictures), "then what goes with this?" (pointing to the central picture as before). The test consists of 20 items of the simpler form and 22 visual analogies.[7]

Analysis of variance of the gain scores yielded a statistically significant finding for treatment effects at the .03 level. The analysis of covariance yielded significant findings for age at the .001 level. The group receiving the television, paraprofessionals and van, and the group receiving television only experienced the highest gain, being 5.14 and 5.37 respectively. The group receiving television and paraprofessional experienced 2.59 gain units, and the control group experienced no gain. Table VII presents the summary table for the analysis of variance of the gain scores and the analysis of covariance of the gain scores using the pretest as a covariate. Table VIII presents the mean gain scores and standard deviations by treatment age and sex for this test.

ITPA Subtest Five (Verbal Expression)

The purpose of this test is to assess the ability of the child to express his own concepts vocally. The child is shown four familiar objects one at a time (a ball, a block, an envelope, and a button) and is asked, "Tell me all about this." The score is the number of discrete, relevant, and approximately factual concepts expressed.[8]

Analysis of variance on the gain score yielded a treatment effect significant at the .002 level, a treatment by age interaction significant at the .04 level, and a treatment by age by sex interaction significant at the .07 level.

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[7] Ibid, p. 10.

[8] Ibid, p. 11.

TABLE VII

SUMMARY TABLE FOR ANALYSIS OF VARIANCE OF GAIN SCORES AND ANALYSIS OF COVARIANCE OF GAIN SCORES USING PRETEST SCORES AS COVARIATE FOR ITPA SUBTEST FOUR (VISUAL-MOTOR ASSOCIATION)

ANOVA

	Sum of Squares	Degrees of Freedom	Mean Square	F	P
T	542.37	3	180.79	3.11	.03
A	307.84	2	153.92	2.64	
S	13.41	1	13.41	0.23	
TXA	300.78	6	50.13	0.86	
TXS	51.23	3	17.41	0.30	
AXS	21.66	2	10.83	0.19	
TXAXS	201.96	6	33.66	0.58	
Within	5356.24	92	58.22		

TABLE VIII

MEANS AND STANDARD DEVIATIONS OF PRETEST AND GAIN SCORES FOR ITPA SUBTEST FOUR (VISUAL-MOTOR ASSOCIATION) ACCORDING TO TREATMENT, AGE AND SEX

AGE (Years)	SEX	Sta-tistic	TV+PP+VAN		TV+PP		TV		CONTROL	
			Pre	Gain	Pre	Gain	Pre	Gain	Pre	Gain
3	M	n	6	6	4	4	6	6	4	4
		$\bar{x}$	12.50	1.50	5.25	6.75	5.50	5.50	7.00	1.00
		SD	3.27	5.96	1.00	3.86	3.70	5.57	3.56	2.71
	F	n	6	6	6	6	6	6	4	4
		$\bar{x}$	10.50	4.67	8.50	4.17	6.83	3.83	9.75	4.50
		SD	4.97	5.24	3.78	7.49	4.71	4.54	5.38	4.20
4	M	n	5	5	5	5	5	5	4	4
		$\bar{x}$	11.60	1.60	12.67	0.00	15.00	4.75	16.75	-1.25
		SD	7.40	8.02	3.06	3.61	2.99	5.38	7.68	4.79
	F	n	4	4	5	5	5	5	5	5
		$\bar{x}$	15.50	7.25	18.40	-1.20	12.40	4.20	24.00	-7.20
		SD	10.88	4.03	9.10	10.18	3.65	3.35	26.51	24.66
5	M	n	6	6	5	5	6	6	5	5
		$\bar{x}$	16.00	8.00	17.80	2.60	21.17	8.17	13.00	-0.00
		SD	4.60	4.47	6.98	6.11	4.22	3.82	4.85	4.58
	F	n	6	6	5	5	4	4	4	4
		$\bar{x}$	12.33	7.83	19.00	3.20	17.00	8.75	18.75	3.50
		SD	10.80	7.47	7.48	7.36	4.16	5.12	6.55	5.32

Figure 4 depicts the treatment by age by sex interaction. The interaction is partially explained by the performance of three, four, and five year old males in the television plus paraprofessional group and the television group. In each of those two groups, measures on the three year olds showed more gain than measures on the four and five year olds, and measures on the five year olds in these two groups indicated negative gains. The interaction is also partially explained by the fact that measures on the five year olds in the television, paraprofessional and van group indicated far superior gains than measures taken on any other of the categories of students.

The treatment effect is partially explained by the fact that the television plus paraprofessional plus van group had an average gain of 4.37 units, which is significantly more than the gains recorded in the remaining three groups. The gain for the television plus paraprofessional plus van group was 4.37 units. For the television plus paraprofessional group it was 0.05 units. The gain for the television group was 1.41. And for the control group the gain was 1.63 units.

Table IX presents the summary table for the analysis of variance on the gain scores and the analysis of covariance on the gain scores using the pretest as the covariate. Table X presents the mean and standard deviation of the gain scores by treatment, age and sex.

It is noteworthy that this subtest was the only one which had items which correlated directly with the objectives used in the program as recorded during the months of April and May of 1969. The objectives were (1) identify and describe an object in terms of its physical characteristics, (2) identify and describe an object in terms of its function, and (3) identify and describe an object in terms of its location. These correlate very directly with Subtest five which measures verbal expression. Verbal expression for this test

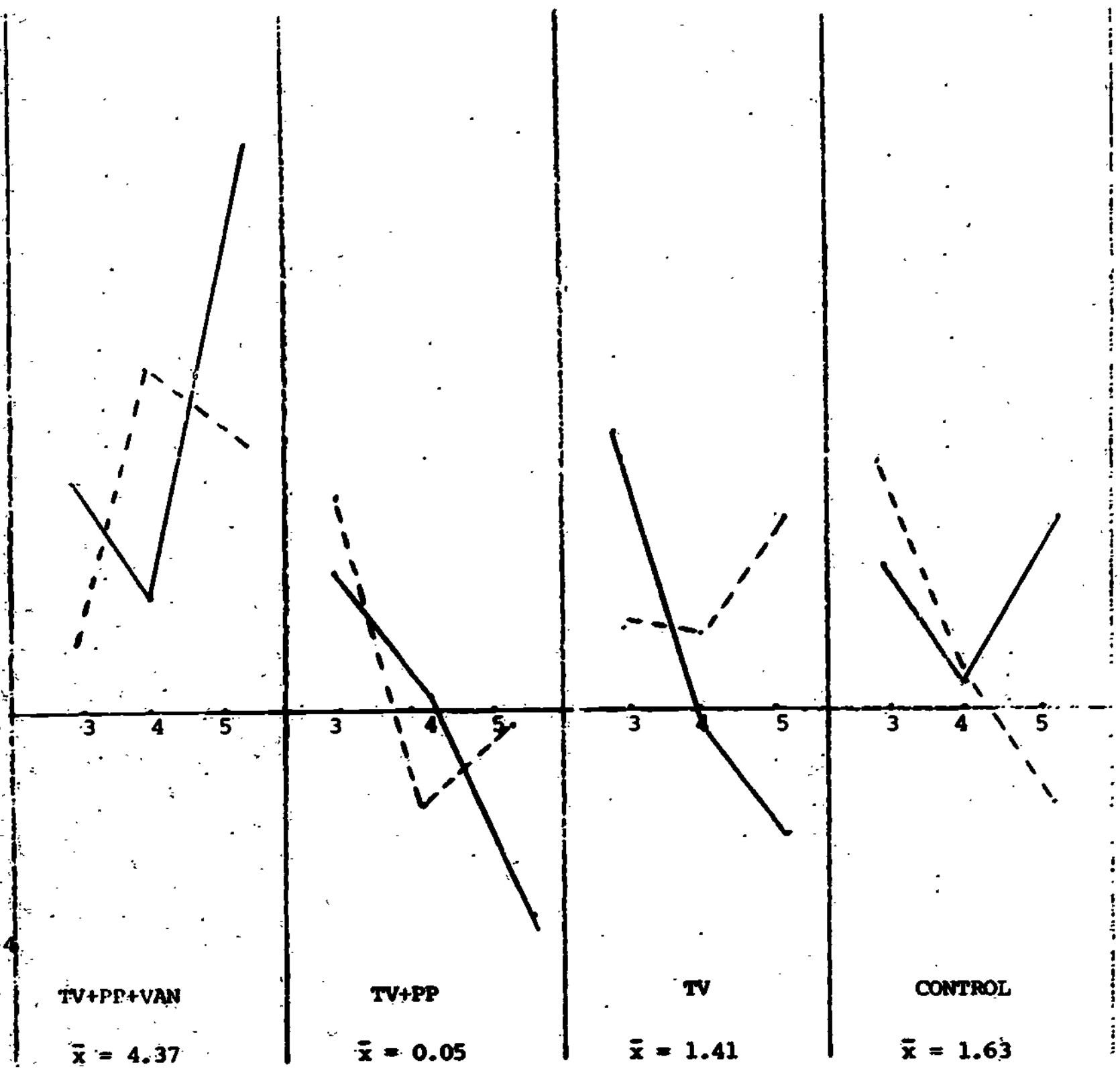

Figure 4

Graphic Depiction of Treatment by Age
by Sex Interaction for the ITPA Subtest Five
(Verbal Expression)

TABLE IX

SUMMARY TABLES FOR ANALYSIS OF VARIANCE OF GAIN SCORES FOR ITPA SUBTEST FIVE (VERBAL EXPRESSION)

ANOVA

	Sum of Squares	Degrees of Freedom	Mean Square	F	P
T	310.80	3	103.60	5.23	0.002
A	70.00	2	35.00	1.77	
S	0.84	1	0.84	0.04	0.084
TXA	283.32	6	47.22	2.38	0.035
TXS	41.85	3	13.95	0.70	
AXS	21.34	2	10.67	0.54	
TXAXS	239.16	6	39.86	2.01	0.07
Within	1823.44	92	19.82		

TABLE X

MEANS AND STANDARD DEVIATIONS OF PRETEST AND GAIN SCORES FOR ITPA SUBTEST FIVE (VERBAL EXPRESSION) ACCORDING TO TREATMENT, AGE AND SEX

AGE (Years)	SEX	Statistic	TV+PP+VAN		TV+PP		TV		CONTROL	
			Pre	Gain	Pre	Gain	Pre	Gain	Pre	Gain
3	M	n	6	6	4	4	6	6	4	4
		$\bar{x}$	13.67	4.00	10.25	2.50	7.50	4.75	6.75	2.75
		SD	6.89	4.82	5.38	2.38	1.92	1.71	4.43	3.40
	F	n	6	6	6	6	6	6	4	4
		$\bar{x}$	15.00	1.17	9.67	3.67	11.83	1.50	9.25	4.25
		SD	7.87	6.40	1.03	3.62	4.54	3.83	5.68	2.63
4	M	n	5	5	5	5	5	5	4	4
		$\bar{x}$	14.00	1.80	16.00	0.33	19.25	-0.25	15.50	0.50
		SD	6.82	3.63	1.73	3.79	6.18	5.56	2.88	5.45
	F	n	4	4	5	5	5	5	5	5
		$\bar{x}$	18.50	5.75	18.00	-1.80	16.60	1.40	10.46	0.80
		SD	11.90	7.41	4.95	5.93	3.58	3.85	4.45	1.64
5	M	n	6	6	5	5	6	6	5	5
		$\bar{x}$	19.50	8.83	21.60	-3.60	23.33	-2.17	12.40	3.20
		SD	5.47	6.80	7.44	7.06	4.23	3.76	8.26	2.50
	F	n	6	6	5	5	4	4	4	4
		$\bar{x}$	17.50	4.67	23.20	-0.80	19.50	3.25	17.25	-1.75
		SD	8.02	2.42	7.98	3.83	2.08	2.99	7.81	0.96

is defined as the child's ability to express his own concepts verbally in terms of concrete properties. These properties may pertain to physical characteristics, functions, or relations to other objects.

ITPA Subtest Six (Manual Expression)

Subtest six taps the child's ability to express ideas manually. This ability is assessed by gestural manipulation tests. In this test fifteen pictures of common objects are shown to the child one at a time and he is asked, "show me what to do with a _____." The child is required to pantomime the appropriate action, such as dialing a telephone or playing a guitar.[9]

Analysis of variance of the gain scores yielded a treatment effect significant at the .02 level. Analysis of covariance on the gain score using the pretest as the covariate yielded treatment effects significant at the .001 level, and an age effect significant at the .01 level. The group receiving television achieved the highest gain with 4.54 units.

The mean gain for the television, paraprofessional and van group was 2.85. The mean gain for the television plus paraprofessional group was negative, 0.6. The mean gain for the television only group was 4.54, and the mean gain for the control group was a negative 1.02.

Table XI presents a summary table of the analysis of variance of the gain scores and the analysis of covariance of the gain scores using pretest scores as a covariate. Table XII presents the mean gain scores of the ITPA Subtest six according to treatment, age and sex.

ITPA Subtest Seven (Grammatic Closure)

This subtest is for assessing the child's ability to make use of:

> The redundancies of oral language in acquiring automatic habits for handling syntax and grammatic inflections. In this test the

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[9] Ibid, p. 11.

TABLE XI

SUMMARY TABLES FOR ANALYSIS OF VARIANCE OF GAIN SCORES FOR ITPA SUBTEST SIX (MANUAL EXPRESSION)

ANOVA

	Sum of Squares	Degrees of Freedom	Mean Square	F	P
T	689.04	3	229.68	3.28	0.02
A	211.26	2	105.63	1.51	0.23
S	103.70	1	103.70	1.48	0.23
TXA	394.62	6	65.77	0.94	-
TXS	110.10	3	36.70	0.52	-
AXS	21.52	2	10.76	0.15	-
TXAXS	132.96	6	22.16	0.32	-
Within	6440.92	92	70.01		

TABLE XII

MEANS AND STANDARD DEVIATIONS OF PRETEST AND GAIN SCORES FOR ITPA SUBTEST SIX (MANUAL EXPRESSION) ACCORDING TO TREATMENT, AGE AND SEX

AGE (Years)	SEX	Statistic	TV+PP+VAN		TV+PP		TV		CONTROL	
			Pre	Gain	Pre	Gain	Pre	Gain	Pre	Gain
3	M	n	6	6	4	4	6	6	4	4
		$\bar{x}$	17.67	5.67	16.25	-1.50	19.00	7.25	14.75	-2.25
		SD	10.48	8.04	5.56	12.29	.82	6.99	12.53	5.38
	F	n	6	6	6	6	6	6	4	4
		$\bar{x}$	18.67	4.33	10.33	1.33	18.50	6.17	20.00	2.50
		SD	9.05	3.93	6.59	8.91	5.32	3.82	7.70	5.26
4	M	n	5	5	5	5	5	5	4	4
		$\bar{x}$	22.00	0.20	22.00	1.67	32.75	0.25	24.75	0.75
		SD	4.30	6.76	6.08	7.02	4.19	1.71	2.75	9.14
	F	n	4	4	5	5	5	5	5	5
		$\bar{x}$	20.25	2.75	20.40	3.40	28.20	2.40	17.80	0.80
		SD	13.79	3.20	6.31	7.20	5.63	3.85	7.76	3.77
5	M	n	6	6	5	5	6	6	5	5
		$\bar{x}$	26.83	2.00	25.20	-5.80	29.17	5.67	27.00	-9.20
		SD	4.83	2.90	8.26	13.57	5.60	6.15	27.12	25.23
	F	n	6	6	5	5	4	4	4	4
		$\bar{x}$	25.83	2.17	27.40	-2.80	29.25	5.50	24.50	1.25
		SD	6.46	4.66	5.90	7.63	6.13	3.70	11.27	1.71

> conceptual difficulty is low, but the task elicits the child's ability to respond automatically to often repeated verbal expressions of standard American speech. The child comes to expect or predict grammatic form so that when part of an expression is presented he closes the gap by supplying the missing parts. The test measures the form rather than the content of the missing word, since the content is provided by the examiner.
>
> There are 33 orally presented items accompanied by pictures which portray the content of the verbal expression. The pictures are included to avoid contaminating the test with difficulty in the receptive process. Each verbal item consists of a complete statement followed by an incomplete statement to be finished by the child. The examiner points to the appropriate picture as he reads the given statements, for example: "Here is a dog; here are ____."[10]

The analysis of variance on the gain score yielded a treatment effect significant at the .003 level. The group of children receiving all three elements of the program scored the least gain on this subtest. Those receiving the television plus paraprofessional and the television group scored the second highest gain. The gain for the television, paraprofessional and van group was .016 units; the gain for the television only group was 3.47 units; the gain for the control group was 2.18 units.

Table XIII presents the summary table of the analysis of variance of the gain scores and the analysis of covariance of the gain scores using the pretest as a covariate. Table XIV presents the means and standard deviations of the gain scores on the ITPA Subtest seven according to treatment, age and sex.

ITPA Subtest Eight (Visual Closure)

This test is to tap:

> The child's ability to identify a common object from an incomplete visual presentation. There are four scenes, presented separately, each containing 14 or 15 examples of a specified object. The objects are seen in varying degrees of concealment. The child is

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[10] Ibid, p. 11

TABLE XIII

SUMMARY TABLES FOR ANALYSIS OF VARIANCE OF GAIN SCORES AND ANALYSIS OF COVARIANCE OF GAIN SCORES USING PRETEST SCORES AS COVARIATE FOR ITPA SUBTEST SEVEN (GRAMMATIC CLOSURE)

ANOVA

	Sum of Squares	Degrees of Freedom	Mean Square	F	P
T	209.10	3	69.70	4.87	0.003
A	36.30	2	18.15	1.27	
X	2.56	1	2.56	0.18	
TXA	138.60	6	23.10	1.61	0.15
TXS	39.84	3	13.28	0.93	
AXS	16.64	2	8.32	0.58	
TXAXS	115.62	6	19.27	1.35	
Within	1315.60	92	14.30		

TABLE XIV

MEANS AND STANDARD DEVIATIONS OF PRETEST AND GAIN SCORES FOR ITPA SUBTEST SEVEN (GRAMMATIC CLOSURE) ACCORDING TO TREATMENT, AGE AND SEX

AGE (Years)	SEX	Statistic	TV+PP+VAN		TV+PP		TV		CONTROL	
			Pre	Gain	Pre	Gain	Pre	Gain	Pre	Gain
3	M	n	6	6	4	4	6	6	4	4
		$\bar{x}$	10.33	-3.00	7.00	4.00	4.50	3.50	5.25	3.75
		SD	3.50	5.02	1.41	3.37	2.08	1.29	5.91	4.27
	F	n	6	6	6	6	6	6	4	4
		$\bar{x}$	11.83	-1.67	6.33	1.33	5.33	3.50	6.75	3.50
		SD	4.71	3.67	1.97	2.58	1.63	1.51	6.19	3.31
4	M	n	5	5	5	5	5	5	4	4
		$\bar{x}$	9.40	2.00	8.67	3.67	12.75	4.50	11.00	1.00
		SD	2.30	2.55	2.08	5.51	6.40	4.51	3.56	7.07
	F	n	4	4	5	5	5	5	5	5
		$\bar{x}$	10.25	-1.00	12.00	3.20	9.00	3.00	11.80	0.60
		SD	7.14	4.32	3.16	1.79	2.92	2.00	7.83	2.30
5	M	n	6	6	5	5	6	6	5	5
		$\bar{x}$	17.33	0.50	15.20	3.40	13.33	1.83	5.40	5.00
		SD	7.39	2.66	9.07	3.44	4.55	2.48	1.52	2.34
	F	n	6	6	5	5	4	4	4	4
		$\bar{x}$	9.33	3.83	15.40	4.40	12.00	4.50	18.25	-0.75
		SD	3.50	4.88	5.13	5.55	4.24	3.70	10.87	6.55

> asked to see how quickly he can point to all examples of a particular object within a time limit of 30 seconds for each scene.[11]

Analysis of variance of the gain score yielded a statistically significant effect for treatment at the .05 level. The two highest gains were experienced by the children in the package group, 4.04 units. The television and paraprofessional group gained 2.89 units and the control group had a negative gain of 0.28. Table XV presents the summary table for the analysis of variance on the gain scores and the analysis of covariance using the pretest as a covariate and the gain scores as the variate. Table XVI presents the means and standard deviations for Subtest eight according to treatment, age and sex.

ITPA Subtest Nine (Auditory Sequential Memory)

The purpose of this test is:

> To assess the child's ability to reproduce from memory sequences of digits increasing in length from two to eight digits. The test differs from the digit repetition task of the Stanford Benet or the WISC in that the digits are presented at the rate of two per second instead of one per second and in that the child is allowed a second trial of each sequence if he fails on the first presentation. He receives more credit for a success on the first than on the second trial. A more rapid presentation makes the task easier, which is necessary for the two and the three year old children.[12]

One striking thing in this analysis was the zero gain for the group having the television, paraprofessional, and van experience. The group receiving television only achieved the next highest, and the control group received the third highest. Table XVII presents the summary table for the analysis of variance of the gain scores and the analysis of covariance of the gain scores using the pretest as a covariate. Table XVIII presents the mean and standard deviations for the subtest nine gain scores by treatment, age and sex.

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[11] Ibid, p. 12.

[12] Ibid, p. 12.

TABLE XV

SUMMARY TABLES FOR ANALYSIS OF VARIANCE OF GAIN SCORES FOR ITPA SUBTEST EIGHT (VISUAL CLOSURE)

ANOVA

	Sum of Squares	Degrees of Freedom	Mean Square	F	P
T	360.30	3	120.10	2.69	0.05
A	202.88	2	101.44	2.27	0.11
S	47.33	1	47.33	1.06	
TXA	70.32	6	11.72	0.26	
TXS	168.09	3	56.03	1.25	
AXS	143.74	2	71.87	1.61	
TXAXS	180.30	6	60.05	1.34	
Within	4115.16	92	44.73		

TABLE XVI

MEANS AND STANDARD DEVIATIONS OF PRETEST AND GAIN SCORES FOR ITPA SUBTEST EIGHT (VISUAL CLOSURE) ACCORDING TO TREATMENT, AGE AND SEX

AGE (Years)	SEX	Statistic	TV+PP+VAN		TV+PP		TV		CONTROL	
			Pre	Gain	Pre	Gain	Pre	Gain	Pre	Gain
3	M	n	6	6	4	4	6	6	4	4
		$\bar{x}$	9.50	3.50	13.25	-0.25	8.75	4.25	18.50	-1.50
		SD	3.08	3.83	.50	4.27	1.89	3.10	4.12	1.73
	F	n	3	3	6	6	6	6	4	4
		$\bar{x}$	9.83	3.67	9.17	2.00	12.00	2.17	9.75	1.75
		SD	3.87	2.42	3.55	5.25	2.76	3.60	1.26	1.89
4	M	n	5	5	5	5	5	5	4	4
		$\bar{x}$	11.20	1.20	14.33	1.00	13.00	2.25	15.00	4.00
		SD	2.95	4.38	1.56	6.93	1.67	4.11	3.83	7.16
	F	n	4	4	5	5	5	5	5	5
		$\bar{x}$	14.25	4.00	12.20	2.20	13.60	4.00	21.80	-7.20
		SD	2.99	3.46	3.42	3.77	3.78	4.74	29.10	24.07
5	M	n	6	6	5	5	6	6	5	5
		$\bar{x}$	17.17	4.17	14.40	5.40	19.50	-0.17	12.40	0.80
		SD	6.23	3.66	2.70	4.28	4.23	4.58	5.27	3.83
	F	n	6	6	5	5	4	4	4	4
		$\bar{x}$	14.17	7.67	18.60	7.00	15.25	11.50	16.00	0.50
		SD	7.91	5.57	3.91	7.00	2.36	1.00	7.30	7.55

TABLE XVII

SUMMARY TABLES FOR ANALYSIS OF VARIANCE OF GAIN SCORES ITPA SUBTEST NINE (AUDITORY - SEQUENTIAL MEMORY)

ANOVA

	Sum of Squares	Degrees of Freedom	Mean Square	F	P
T	486.96	3	162.32	4.85	.004
A	26.96	2	13.48	0.40	
S	83.46	1	83.46	2.49	0.12
TXA	131.46	6	21.91	0.65	
TXS	125.67	3	41.89	1.25	
AXS	38.18	2	19.09	0.57	
TXAXS	230.46	6	38.41	1.15	
Within	3081.72	92	33.50		

TABLE XVIII

MEANS AND STANDARD DEVIATIONS OF PRETEST AND GAIN SCORES FOR ITPA SUBTEST NINE (AUDITORY-SEQUENTIAL MEMORY) ACCORDING TO TREATMENT, AGE AND SEX

AGE (Years)	SEX	Sta-tistic	TV+PP+VAM		TV+PP		TV		CONTROL	
			Pre	Gain	Pre	Gain	Pre	Gain	Pre	Gain
		n	6	6	4	4	6	6	4	4
3	M	$\bar{X}$	13.67	0.33	14.25	2.25	7.75	8.00	5.25	4.50
		SD	6.09	7.28	4.65	4.03	2.50	7.39	4.43	2.38
		n	6	6	6	6	6	6	4	4
	F	$\bar{X}$	13.83	-1.17	9.17	4.50	8.67	4.33	15.25	-1.50
		SD	7.65	6.74	3.71	2.66	4.32	5.32	2.99	4.44
		n	5	5	5	5	5	5	4	4
4	M	$\bar{X}$	12.60	1.60	22.67	4.33	18.50	6.25	14.50	8.00
		SD	8.88	8.02	9.07	1.16	6.25	7.23	3.87	7.75
		n	4	4	5	5	5	5	5	5
	F	$\bar{X}$	20.50	-4.5	19.80	3.40	19.80	6.00	9.60	3.00
		SD	12.07	9.75	6.06	4.83	8.95	4.85	5.42	3.81
		n	6	6	5	5	6	6	5	5
5	M	$\bar{X}$	20.83	-2.83	16.60	6.20	24.17	1.67	12.40	5.20
		SD	4.54	8.75	5.18	6.11	6.34	2.58	5.90	4.87
		n	6	6	5	5	4	4	4	4
	F	$\bar{X}$	17.67	2.83	22.40	2.20	18.50	3.25	17.00	-0.50
		SD	8.82	7.30	9.79	2.39	2.38	1.89	5.94	1.92

ITPA Subtest Ten (Visual Sequential Memory)

According to the authors:

> This test assesses the child's ability to reproduce sequences of non-meaningful figures from memory. A child is shown each sequence of figures for five seconds and then is asked to put corresponding chips of figures in the same order. Here again the child is allowed two trials on each sequence when the first attempt is unsuccessful. The sequences increase in length from two to eight figures.[13]

The analysis of variance for Subtest ten gain scores yielded a treatment effect significant at the .02 level; the analysis of covariance yielded a treatment effect significant at the .005 level; an age effect significant at the .001 level. One surprising finding was that the group with the television, paraprofessional and van experienced negative gain, while the remaining three groups experienced gains of at least three units. Table XIX presents the summary table for the analysis of variance of the gain scores. Table XX presents the mean gain scores by treatment, age, and sex for Subtest ten.

ITPA Total Test

The composite score for the total test yielded no significant differences from the analysis of variance of the gain scores. Analysis of variance on the gain scores of the total test scores yielded an age factor significant at the .001 level.

The total gain for the three year olds was 28.44; for the four year olds it was 22.02; and for the five year olds it was 27.83. Ostensibly, this suggests that in general for language development the three and five year olds are more sensitive to the testing situation or are maturing at a faster rate than the four year olds.

Table XXI presents analysis of variance summary table and Table XXII presents mean gains and standard deviations of total tests.

TABLE XIX

SUMMARY TABLE FOR ANALYSIS OF VARIANCE OF GAIN SCORES FOR ITPA SUBTEST TEN (VISUAL SEQUENTIAL MEMORY)

ANOVA

	Sum of Squares	Degrees of Freedom	Mean Square	F	
T	330.42	3	110.14	3.30	.02
A	52.02	2	26.01	0.78	
S	156.29	1	156.29	4.68	
TXA	127.02	6	21.17	0.63	
TXS	8.37	3	2.79	0.08	
AXS	20.62	2	10.31	0.31	
TXAXS	370.08	6	61.68	1.85	
Within	3071.51	92	33.39		

TABLE XX

MEANS AND STANDARD DEVIATIONS OF ITPA
SUBTEST TEN (VISUAL SEQUENTIAL MEMORY)
PRETEST AND GAIN SCORES BY TREATMENT, AGE AND SEX

AGE (Years)	SEX	Statistic	TV+PP+VAM		TV+PP		TV		CONTROL	
			Pre	Gain	Pre	Gain	Pre	Gain	Pre	Gain
3	M	n	6	6	4	4	6	6	4	4
		$\bar{x}$	6.50	1.33	8.75	3.00	4.50	7.25	1.25	5.00
		SD	3.27	5.05	4.50	2.15	5.79	2.06	2.50	1.63
	F	n	6	6	6	6	6	6	4	4
		$\bar{x}$	9.00	1.17	6.50	1.33	7.00	3.50	3.25	5.75
		SD	6.26	5.56	3.45	3.44	1.55	4.72	4.72	5.56
4	M	n	5	5	5	5	5	5	4	4
		$\bar{x}$	7.40	4.80	8.00	4.00	13.25	1.75	8.25	4.75
		SD	3.51	5.36	2.65	7.81	2.50	4.11	4.11	3.95
	F	n	4	4	5	5	5	5	5	5
		$\bar{x}$	13.00	-6.50	12.60	5.40	15.80	3.60	12.80	1.00
		SD	10.80	11.27	4.04	7.09	4.97	3.29	6.18	4.18
5	M	n	6	6	5	5	6	6	5	5
		$\bar{x}$	13.50	2.33	12.80	7.40	15.00	4.00	11.40	3.60
		SD	6.47	9.61	4.61	6.11	4.94	6.54	5.27	4.34
	F	n	6	6	5	5	4	4	4	4
		$\bar{x}$	14.33	-1.17	14.80	0.60	20.25	-1.25	14.75	2.75
		SD	8.54	8.40	5.68	5.86	.50	3.10	5.06	3.78

TABLE XXI

SUMMARY TABLES FOR ANALYSIS OF VARIANCE OF GAIN SCORES FOR ITPA TOTAL TEST

ANOVA

	Sum of Squares	Degrees of Freedom	Mean Square	F	P
T	2239.53	3	746.51	1.94	0.13
A	884.60	2	442.30	1.15	0.32
S	148.93	1	148.93	0.39	-
TXA	3069.54	6	511.59	1.33	0.25
TXS	353.52	3	117.84	0.31	-
AXS	480.96	2	240.48	0.63	-
TXAXS	2400.58	6	400.93	1.04	-
Within	35375.00	92	384.52		

TABLE XXII

MEANS AND STANDARD DEVIATIONS OF PRETEST AND GAIN SCORES FOR TOTAL ITPA ACCORDING TO TREATMENT, AGE AND SEX

AGE (Years)	SEX	Sta-tistic	TV+PP+VAN		TV+PP		TV		CONTROL	
			Pre	Gain	Pre	Gain	Pre	Gain	Pre	Gain
3	M	n	6	6	4	4	6	6	4	4
		$\bar{x}$	126.50	23.33	113.25	24.00	76.00	50.50	71.75	28.50
		SD	34.80	19.03	27.56	24.04	11.75	23.95	46.28	20.63
	F	n	5	6	6	6	6	6	4	4
		$\bar{x}$	135.33	17.67	92.83	23.67	98.17	33.33	108.25	26.50
		SD	46.88	15.56	11.00	13.41	25.68	17.95	39.19	14.98
4	M	n	5	5	5	5	5	5	4	4
		$\bar{x}$	127.20	21.00	146.33	23.67	167.25	22.00	56.75	29.25
		SD	37.85	26.11	15.63	34.49	33.47	12.44	45.21	31.10
	F	n	4	4	5	5	5	5	5	5
		$\bar{x}$	172.50	11.25	163.00	17.60	165.40	24.00	129.40	27.40
		SD	99.39	19.29	25.49	21.87	34.63	15.60	48.97	12.93
5	M	n	6	6	5	5	6	6	5	5
		$\bar{x}$	204.83	27.33	174.80	25.60	203.17	28.50	125.00	25.60
		SD	52.93	10.97	49.70	19.63	37.19	17.26	46.19	17.44
	F	n	6	6	5	5	4	4	4	4
		$\bar{x}$	158.00	39.17	201.00	21.40	181.50	48.75	25.25	6.25
		SD	72.78	19.16	43.66	24.05	9.47	25.62	72.88	10.44

Discussion

The original question was concerned with whether or not the program appears to be having any effect on the language development of the children. The answer to this is a qualified yes. The one subtest of the ten which correlated directly with the objectives used in the program, when analyzed, produced a statistically significant treatment effect. This significant difference when graphed showed that the subjects receiving the television, paraprofessionals and van did achieve far more gain than those subjects in the other groups, suggesting that the van is having a substantial impact on the trait measured by the ITPA Subtest five. This further suggests a very important relationship between the activities in the van and those objectives in the curriculum concerned with children being able to describe objects in terms of physical characteristics, being able to describe an object in terms of its function, and in terms of its location.

The control group achieving higher gains than the other groups is puzzling. Among many alternate hypotheses there are at least two which may account for this pehenomenon. First, there is the possibility of test reaction. This is where the students achieve learning from taking the test. The ITPA is an extremely complicated test, taking approximately 40-60 minutes to administer. It is reasonable to expect that this amount of time devoted to testing would itself have an effect on the response of the subjects. A second hypothesis is that those students in the control group are being exposed to other programs which tend to facilitate the development of traits measured by the ITPA.

Appendix E

Final Report
of
An Analysis of Children's Language Behavior

Conducted for
The Appalachia Educational Laboratory

by

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Submitted: July 27, 1969

The analysis of children's language behavior reported here was authorized by the Appalachia Educational Laboratory as part of the assessment of its work with preschool children in communities of West Virginia. Subjects for this investigation had received three types of educational intervention, which will be referred to here as Treatment A, Treatment B, and Treatment C. Treatment A involved home visitation, group work, and programmed training via television. Treatment B consisted of home visitation and the television training. Treatment C was wholly dependent on the television training.

Each of the Laboratory's three treatments was applied to children falling roughly into younger, middle, and older age groups, which will here be designated Age Groups 1, 2, and 3. Whatever the original composition of these groups may have been, the language samples available for analysis represented somewhat varying numbers of children. There is also a wide range of ages of individuals in each group, and this fact should be kept in mind when interpretation of data reported in this study is offered. On the other hand, it is true that mean ages of children in subsets of a single age group are not very different. Table 1 shows the mean age and age range of the three age groups given each treatment, computed as of

May 25, 1969. In making the individual computations, no account was taken of periods up to 16 days beyond a full month, but 16 days or more were counted as a whole month. Table 1 also shows the numbers of children in the various categories whose language samples have been analyzed in this investigation.

Table 1

Numbers of Subjects, Mean Ages, and Age Ranges in Nine Categories
(Ages reported in months)

	Age Group 1		Age Group 2		Age Group 3	
	Mean Age	Range	Mean Age	Range	Mean Age	Range
Treatment A	46.90	44-54	59.75	57-62	71.22	67-74
	n = 10		n = 10		n = 9	
Treatment B	48.60	44-55	62.00	57-66	73.00	68-77
	n = 8		n = 10		n = 10	
Treatment C	48.56	44-55	61.40	55-66	72.89	67-78
	n = 9		n = 9		n = 9	

On the basis of treatment labels and age group designations, the nine categories of subjects of this study may conveniently be referred to as A1, A2, A3, B1, B2, B3, C1, C2, and C3.

The Purposes of the Study

The analysis of language behavior conducted in this investigation was intended to apply objective measurements to language production of children affected by the Appalachia Educational Laboratory's three types of educational intervention and to compare the language behavior of subgroups of those children. It was also planned to make possible various comparisons

of the language production by the West Virginia children with that of kindergarten children in Tennessee reported by O'Donnell, Griffin, and Norris (1967). It was set up to provide evidence on gross volubility, fluency, and syntactic control. Children's syntactic control was to be measured in terms of their rates of use of certain language structures.

Language Samples Collected for Analysis

Late in the spring of 1969, the Appalachia Educational Laboratory arranged the collection of language samples from children with whom it had worked, following a procedure intended to be comparable to that employed in the study reported by O'Donnell, Griffin, and Norris (1967). As in the Tennessee investigation, subjects were shown two eight-minute movie films, animated cartoon versions of Aesop's fables of "The Ant and the Dove" and "The North Wind and the Sun." (The films are found in the Coronet Language Arts series.) Each movie was shown with the sound turned off, to prevent influence of the narrator's language on that to be elicited from the child who viewed it. When a child had seen one of the films, he was asked to tell what he had seen and to comment on the "lesson" pointed up in the fable. Later, he saw the second film and was encouraged to respond to it in the same way. The interviewers' talk and children's oral responses were recorded on magnetic tapes, which were transmitted to the Institute on School Learning and Individual Differences at George Peabody College for Teachers. Transcriptions from those tapes, carefully verified to assure accuracy, constitute the language corpus analyzed in this investigation.

It must be noted that the intent to follow the language sampling procedures applied in Murfreesboro, Tennessee, was not fully realized.

Interviewers in Murfreesboro were strictly confined to preplanned formulas to elicit the child's recounting of what he had seen in the movie. (Example: "Now, in your own words, I would like you to tell me the story of 'The Ant and the Dove.'") Control of their manner of stimulating the child to comment on the "lesson" of the fable was not quite so rigid, but Murfreesboro interviewers closely followed instructions to hold their unplanned conversation to a minimum. West Virginia interviewers, however, regularly led children through series of questions and cues that had few common patterns. In only a few instances did West Virginia children proceed through an extended, uninterrupted, narrative of what they had seen in the films. Most frequently, they responded briefly to queries and promptings, often in elliptical expressions of denial or assent, in other syntactically incomplete constructions, or in assertions such as "I don't know." At some points, quite irrelevant conversations developed; they were excluded from analysis and reporting.

For the most part, no doubt, the practice of the West Virginia interviewers was a response to unwillingness or inability of the children to offer unassisted accounts of what they had seen and how they had interpreted the films. The possible implications of this assumption will be discussed later.

Some difficulty developed in the recording and transcription of the children's language samples. The speech of one child (a boy in subgroup B5) was so indistinct that it could not be properly deciphered. Responses of two other children interviewed (one in subgroup A1, the other in subgroup A5) could not be located on the tapes; quite likely, when they were interviewed the recorder was not operating properly. Names of these three

children will be found in Appendix A, which also lists, in the subgroups to which they belong, the 84 children whose language samples have been analyzed.

In all, a total of 15,712 words produced by the children were subjected to study.

Analysis of the Language Samples

The verified transcriptions of children's oral responses, after elimination of irrelevant conversation, were first marked to identify audible pauses (the oral signs of hesitation usually transcribed as "uh") and garbles (false starts, abnormal redundancies, and hopelessly tangled syntax). Thus freed from clutter, the recorded speech samples were then segmented into what, following Hunt (1965), are called T-units, short for "minimal terminable syntactic units." A complete T-unit is the kind of syntactic construction traditionally identified as a grammatically complete simple or complex (but not compound or compound-complex) sentence.[1] If an expression lacks either a subject or a predicate, or both, it is in this study (for convenience and with some theoretical justification) called an incomplete T-unit.

T-units (both complete and incomplete) were individually entered on analysis sheets, one of which is attached to this report as Appendix B. Items listed on the analysis sheets include a word count and a record of whether the T-unit was complete or incomplete, as well as a count of garbles and audible pauses in it. The greater part of the analysis sheet (69 items),

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1. Advantages of employing the T-unit as the basic reference unit in studies of children's language are demonstrated by Hunt (1965) and O'Donnell, Griffin, and Norris (1967).

however, relates to incidence of syntactic features of the T-unit. Entries on the analysis sheet will be explained in the next section of this report.

Occurrence of any feature named on the analysis sheet was recorded. Analysis of T-units and recording of their syntactic features were performed by competent individuals, but each analysis sheet was rechecked by the director of this investigation.

Summaries of all analysis sheets for each individual child constitute the raw data from which the more refined statistics reported here have been derived. The summaries comprised not only sums of occurrences specifically named on the analysis sheets but also reports on incidence of responses consisting only of single-word expressions of assent or dissent, incidence of other one-word responses, total incomplete units consisting of more than one word, total multiple-word units, and total words in multiple-word units. ("Multiple-word units" include all those composed of more than one word.)

At this point, an explanation of the word count is in order. Customary entries in standard dictionaries were generally depended on for identification of individual words, but two special rules were adopted. Contractions such as don't, isn't, and he'd were counted as two words, and ordinary compound nouns were given the count indicated by the number of bases compounded. Thus motorcycle was counted as two words (a noun adjunct + a noun), as was windmill or bedroom. But words such as sometimes and anything were not regarded as "ordinary compound nouns;" they were counted as single words.

Explanation of Items on the Analysis Sheet

Most of the items entered on the analysis sheet were selected for attention because investigations have shown them to be significant in assessment of language performance of preschool and elementary school children.[2]

Since the intent was to provide for possibilities of a quite high upper limit of language maturity, some items were included that were unlikely to occur in the speech of six-year olds. Examples are "Introductory adverbials with inverted subjects," "Expanded phrasal verbs," "Pre-posed series of three or more adjectives," "Post-posed series of two adjectives," and "Post-posed series of three or more adjectives." On the other hand, the groups of items relating to negations and questions would ordinarily figure importantly only in the study of language acquisition of children younger than those dealt with here. By age four, normal children characteristically have effective command of these resources. The items on negations and questions were included in this analysis because they were given special attention in the syllabus prepared by Hooper and Marshall (1968) for the work to be carried on with the West Virginia preschool children.

Syntactic features identified in the analysis sheet as "simple structures" are those explained in the transformational theory of grammar as being derived from a single base. "Complex structures" are those accounted for in transformational theory as deriving from two or more syntactic bases. A glance at the analysis sheet will show that it

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2. See, for example, Templin (1957), Loban (1963), Hunt (1965), O'Donnell, Griffin, and Norris (1967), and Menyuk (1969).

identifies some general categories of syntactic atructurea that are broken down into components, the hierarchical relationships being indicated by identation. Generally, then, the sum of parallel indented entries would indicate the total occurrencea of the feature categorized in the superior heading (in the next left position) immediately above them. An exception to this rule ia made, however, for the entriea, "Elliptical negationa" and "Elliptical queations," and the exception ia indicated by their aingularity; they are not breakdowns of a auperior categor,.

Many of the entries on the analysia sheet are ao traditional in form that they need no explanation. Those that may raise queations will be accounted for here in the order in which they appear on the analyais sheet.

Wh-quest:ona, so called because many of them begin with worda like who, what, where, why, are questions that cannot be answered aimply by "yes" or "no."

Expletive constructions are thoae that have an empty word in the subject position, while the actual subject ia expreased later in the clause. The commoneat kind of expletive conatruction may be exemplified by the sentence, "There are three children here." Another type ia illustrated in "It is true that I ran away."

Introductory adverbiala with inverted subject are exemplified by "Then came the dawn."

In thia analyais, expanded phrasal verbs are arbitrarily defined as verbal expressions consisting of a principal verb preceded by more than one auxiliary. Thus, "He may have been going" is aaid to contain an

expanded phrasal verb, but "He should listen" does not (under the adopted definition). The infinitive particle to does not figure in this count of words. It should be added that verb forms following the principal verb are here not regarded as expanding the phrasal verb. Thus, "He was going to write" is not regarded as containing an expanded phrasal verb.

Relating to the items involving adjectives, only two points need clarification. First, predicate adjectives (sometimes called adjective complements) such as brave in "The hero was brave," were not counted because (a) transformational theory regards them as belonging to the elemental syntactic base of a sentence and (b) children normally acquire their use very early. Of course, a series of predicate adjectives (as in "The hero was brave and strong")would be reported among coordinations. Second, it should be understood that when two or more adjectives stand before or after the nominal they modify, the analysis sheet calls for recording them as a single series. But in the total adjective count, every individual adjective involved in pre-posed and post-posed series was recorded.

Noun adjuncts are illustrated by summer in the construction summer day or by motor in motorcycle.

The genitive forms counted as modifiers are only those that precede the nominal, as in his book. A later, separate item provides for recording predicate genitives such as his in "The book is his."

Nominalizations of verbs are infinitives or verbals ending in -ing, (often called gerunds) when they clearly function in ways nouns may function. "To fish is fun" and "Fishing is fun" both illustrate such nominalization. But so do "He wanted to fish" and "He liked fishing."

The analysis sheet calls for separate recording of infinitives such as that in "He wanted to fish," identifying it as a special kind of element in a verb phrase. There is overlap, then, in the item dealing with nominalizations of verbs and the item on infinitives in verb phrases. But there are differences not only in the fact that nominalizations include gerunds, but also because infinitives that extend verb phrases are not all nominals. In "He is going to fish," the infinitive would be listed as belonging to the verb phrase but not as a nominalization. It must be clearly understood, of course, that infinitives are not counted when they represent the principal verb associated with auxiliaries in phrasal expressions such as may go or ought to go.

Sentence adverbials are here to be understood as adverbials that modify or are loosely associated with a whole sentence. They do not specifically modify a particular element in the T-unit. There is some room for variations in judgment of what constitutes sentence adverbials; hence, attention must be given to some particular rules applied in this analysis. T-unit introductory words such as well, no, yes, and oh were regarded as sentence adverbials, as were words like moreover and however in all positions. Clauses such as I think or you see were placed in the category of sentence adverbials when they were introjected within another clause. Such expressions were also so labeled when they came at the ends of clauses, as were tag questions like "did he?" and "didn't he?" But when such an expression as "I think" was the first element in a clause that offered a nominal object of the verb, it was naturally not identified as a sentence adverbial.

Finally, it may be noted that when two T-units were joined by a coordinating conjunction (examples: and, but, for, and so when it does not carry the sense of purpoae), the conjunction was regarded as introducing the second T-unit. But this kind of introductory expression is understood as a linker, not as a sentence adverbial.

Procesaing and Reporting the Data

The analyses performed in this inveatigation dealt with behavior of children in nine subgroups defined solely by treatment type and age range. Further breakdown by aex appeared not to be feasible because membership in all such subsets would have been very low; two of them would have been composed of only three children. Table 1 has identified the subgroups studied.

Some of the language features noted in analyses and summaries showed such wide individual variations that it seemed most appropriate to report their total production in terms of subgroup means, ranges, and standard deviations. For the aame reason, subgroup means, ranges, and standard deviations are reported for the percentages of all multiple-word units that were incomplete. Subgroup means of total production of both complete and incomplete T-units were computed, but it appeared unnecessary to report them.

For all other language features that figure in this report, beginning with item 16 on the analysis aheet, the individual and subgroup rates of incidence per 100 T-units were computed. The subgroup means are presented in three tables.

A few items named on the analysis sheet (predicate genitives, for example), were found not to be represented in the corpus studied; others were observed

to occur so sporadically that statistical attention to them is useless. Still other items are not reported in the tables because their occurrences were almost invariantly tied to another language feature that is accounted for. For example, 51 of the 61 participles that modified nominals in the language samples were in the present tense; considering also the subgroup scatter of past participles, it seemed trivial to process statistically the tense differentiation in adjectival participles.

When the raw data on occurrence of various syntactic features in each child's language production had been translated into percentages of the multiple-word units they had produced, those percentages constituted the input for a 3 x 3 factorial analyses of variance as shown in Figure 1 (Lindquist, 1953, pp. 207-216).

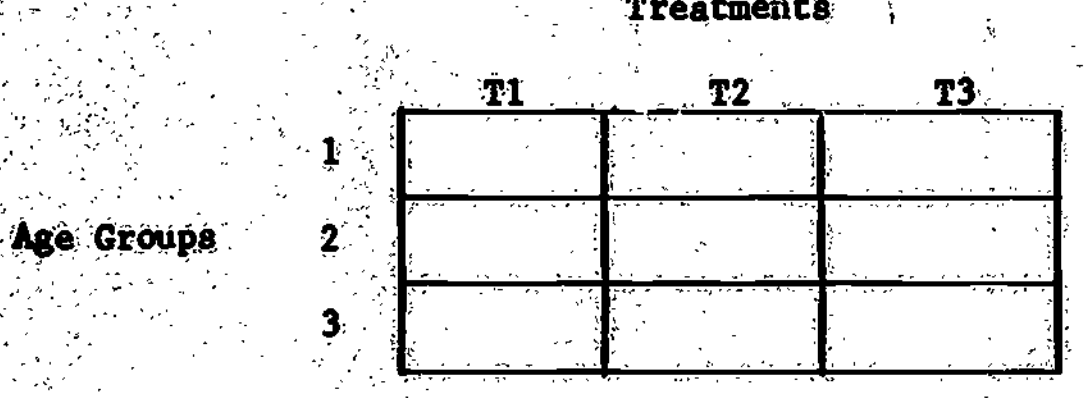

Figure 1. Experimental Design used to assess treatment and group effects.

Subanalyses were conducted at each age group level using the simple randomized analyses of variance (Lindquist, 1953, pp. 47-66). If significant differencea were found between treatments at a particular age group level, orthogonal comparisons were used to test the following hypotheses:

$$H_1 : \mu_{T1} = \frac{\mu_{T2} + \mu_{T3}}{2}$$

$$H2 : \mu_{T2} = \mu_{T3}$$

The Processed Data

Table 2 shows for subgroups of subjects the mean frequency, standard deviation, and individual range of total occurrences of garbles, audible pauses, single words of assent or dissent, and other one-word responses.

Table 3 reports subgroup means, standard deviations, and individual ranges of percentages of multiple-word units that were incomplete, total words in multiple-word units, and mean word length of multiple-word units.

Tables 4, 5, and 6 all report, for treatment-age subgroups, incidence of certain language features as ratios of occurrence per 100 multiple-word T-units (both complete and incomplete). These tables are closely but not exactly keyed to the analysis sheet. As explained earlier, some items on the analysis sheet have been omitted. Some rearrangement of the order of items has also proved desirable.

Table 4 reports rates of occurrence of ten types of expression which, for reasons explained earlier, are labeled "simple structures." It should be noted that in Table 4, the sum of contracted negatives and negative words approximates the total shown for negations in general; implied negatives figure in that total, but were so few in number that they were not entered in the table. Similarly, yes/no questions and wh-questions make up the total for questions in general.

Table 5 reports the relative incidence of complex syntactic structures that do not involve full clauses. It should be noted that some of the categories are broken down into constituents indicated by indentation.

In Table 6 are shown the mean occurrences per 100 multiple-word T-units of various types of subordinate clauses and of the use of co-ordinating conjunctions to introduce T-units. As in Tables 4 and 5, break-downs of categories are indicated by indentation in the item list.

Table 2

Incidence of Garbles, Audible Pauses, Yes/No Responses and Other One-Word Responses

Treatment-age subgroups	Garbles $\bar{X}$	Garbles s	Garbles Range	Audible Pauses $\bar{X}$	Audible Pauses s	Audible Pauses Range	Yes/No Responses $\bar{X}$	Yes/No Responses s	Yes/No Responses Range	Other one-word Responses $\bar{X}$	Other one-word Responses s	Other one-word Responses Range
A1	8.70	9.52	0-32	6.10	7.55	0-25	9.50	6.48	0-17	3.70	1.42	1-16
B1	3.90	3.28	0-9	2.30	2.67	0-9	5.30	2.63	1-11	3.00	2.62	0-7
C1	2.89	5.51	0-17	1.67	2.74	0-8	3.78	3.55	0-11	4.33	3.74	0-11
A2	9.87	12.62	1-32	4.62	6.50	0-18	6.50	3.37	1-16	6.25	6.71	0-20
B2	8.40	6.62	0-18	8.60	8.11	0-24	5.10	2.47	1-10	2.60	2.50	0-7
C2	11.30	11.75	0-37	11.10	14.31	0-48	8.60	7.65	1-25	2.30	3.43	0-10
A3	8.78	13.49	0-16	4.89	7.28	0-22	5.11	5.69	0-19	2.22	2.33	0-6
B3	8.56	5.46	2-19	5.33	6.14	0-20	4.89	2.42	1-9	1.33	1.00	0-3
C3	10.00	8.29	1-20	3.76	4.41	0-14	8.33	4.72	0-16	2.78	2.22	1-8

Table 3

Percentage of Multiple-Word Units Incomplete, Total Words in Multiple-Word Units, and Mean Word Length of Those Units

Treatment-age subgroups	% of multiple-word units incomplete			Total words in multiple-word units			Mean word length of multiple-word units		
	$\bar{X}$	s	Range	$\bar{X}$	s	Range	$\bar{X}$	s	Range
A1	28.80	16.66	11.11-71.43	169.70	110.62	45-386	5.49	1.20	3.50-7.15
B1	30.88	25.72	10.34-100.00	115.10	49.86	52-199	4.59	.93	3.25-6.24
C1	42.54	28.62	0.00-100.00	72.11	53.91	19-178	4.84	1.88	3.17-9.00
A2	31.00	15.86	9.10-53.57	155.00	98.31	46-377	5.06	1.12	3.07-6.39
B2	25.77	15.88	10.00-55.55	216.90	175.40	69-411	6.08	10.29	3.83-7.89
C2	29.64	16.02	9.48-61.91	228.80	120.31	78-463	5.90	1.47	3.76-8.90
A3	20.61	11.95	2.98-37.50	225.89	161.04	45-386	6.16	1.25	2.94-6.87
B3	27.94	13.35	6.45-46.43	196.44	50.42	124-289	6.15	0.95	4.43-7.00
C3	32.05	17.21	13.16-60.00	213.33	86.70	140-423	6.15	2.01	4.12-10.85

Table 4

Mean Incidence of Simple Structures: Occurrence per 100 Multiple-Word T-Units

Variable	Treatment-Age Subgroups								
	A1	B1	C1	A2	B2	C2	A3	B3	C3
Negations (all types)	32.04	24.30	41.02	25.31	18.21	17.01	19.39	13.99	18.90
Contracted Negatives	17.99	13.15	25.37	14.69	10.08	9.79	11.21	7.34	9.61
Negative Words	13.59	11.15	14.28	10.61	7.84	7.22	8.18	5.59	9.29
Elliptical Negatives	21.63	11.15	12.69	11.43	5.88	7.22	7.88	5.59	8.65
Questions (both types)	2.59	3.98	.75	5.31	4.20	4.38	1.21	5.24	3.52
Yes/No Questions		1.59		2.04	1.96	2.06	.91	2.80	.96
Wh-Questions	2.59	2.39	.75	3.27	2.24	2.32	.30	2.45	2.56
Elliptical Questions		1.19	.75	2.86	1.12	.77		2.10	1.92
Expletive Constructions	.95	.29		.63	1.54	.45	.54	1.14	2.39
Indirect Objects	3.14	.91	.44	2.24	2.58	2.66	2.95	3.12	5.64

Teble 5

Mean Incidence of Subclausal Complex Structures:

Occurrence per 100 Multiple-Word T-Units

Variable	Treatment-Age Subgroups A1	B1	C1	A2	B2	C2	A3	B3	C3
Non-clausal modifiers of nominals	28.05	19.47	15.70	22.62	30.51	27.34	27.36	30.26	35.40
Adjectives	6.47	6.76	6.72	5.41	11.74	6.19	4.38	5.53	4.45
Single, pre-posed	4.40	3.35	6.28	4.88	10.11	4.92	3.96	3.59	7.08
Pre-posed series of two	.92	1.70	.44		.93	.38	.16	.28	.30
Single, post-posed	.17			.52	.67	.47			1.61
Noun adjuncts	4.57	4.19	1.97	3.37	6.23	4.33	6.70	4.88	3.60
Appositives	2.26	.86	.44	1.74	.24	1.34	1.60	1.57	2.52
Genitive forms	9.02	5.95	4.74	5.83	6.68	7.29	9.45	9.83	8.43
Participles (non-phrasal)	.77		.43	1.70	.21	1.16	.36	.80	.95
Phrases	3.75	1.70	1.01	3.40	5.64	5.65	2.84	8.23	8.58
Prepositional	3.12	1.22	1.01	3.02	4.58	4.36	1.77	3.64	6.62
Participial	.17			.97	.88	1.13	1.06	2.23	1.55
Infinitives	.46	.47			.18	.16	.53	2.36	.40
Nominalizations of verbs	3.20	1.01	3.22	2.94	4.21	4.20	5.32	8.07	4.53
Gerunds	1.34		1.70	.85		2.12	.99	2.63	1.62
Infinitives	1.69	1.72	1.51	2.09	4.92	2.08	4.32	5.45	2.91
Infinitives in verbal expressions (excluding those associated with modal auxiliaries)	4.52	2.35	4.82	4.13	6.31	6.70	4.97	6.84	9.73
Adverbials of Manner	3.00	2.16	.79	2.06	.36	2.11	.45	1.36	.99
Single words	2.53	.58		1.70	.36	.83	.16	.83	
Prepositional phrases	.48	1.57	.79	.36		1.42	.33	.53	.99
Sentence Adverbials	4.12	2.73	2.13	5.23	7.95	6.27	4.08	6.74	5.83
Coordinated structures within T-Units	9.25	6.49	16.99	6.37	11.97	9.83	14.80	19.50	11.25
Nominals	2.46	1.49	1.33	1.49	5.14	2.43	2.73	7.47	3.66
Adjectivals			.79	.89	.74	.54		1.20	
Adverbials	2.04	.23	.85	.36	.46	.31	1.57	.46	.79
Predicates	4.75	4.78	14.01	3.62	5.62	6.54	10.86	9.93	6.80

Table 6

Mean Incidence of Subordinate Clauses and of T-Units Introduced by Coordinating Conjunctions: Occurrence per 100 Multiple-Word T-Units

Variable	Treatment-Age Subgroups								
	A1	B1	C1	A2	B2	C2	A3	B3	C3
Total subordinate clauses	14.76	11.55	13.43	7.75	21.56	16.24	13.33	17.82	14.74
Noun clauses	6.42	1.89	1.44	1.61	6.12	4.74	4.38	5.53	4.45
Adjective clauses	1.73	3.44	1.78	.85	4.99	3.08	1.24	1.92	1.68
Introduced by relative pronouns	.54	.91	.44	.21	1.16	1.71	.18	.94	
Without introductory word	1.19	2.98	1.33	.64	3.81	1.36	1.07	.98	1.68
Adverbiel clauses	6.11	3.90	5.88	3.38	7.23	6.40	8.38	10.73	8.74
Time	1.52	.62	2.99		1.61	2.37	2.36	2.70	3.34
Place	.35						.16		
Manner					.36		.33	.40	
Cause	3.96	3.28	1.66	3.15	4.54	3.64	4.92	6.58	5.00
Condition	.29				.63	.38	.18		
Comparison				.21	.21				
Purpose			.43		.33		.18	.79	.40
Result							.18	.26	
Other			.79		.24				
T-units introduced by coordinating conjunctions	14.13	14.35	6.16	21.18	23.85	21.77	28.98	28.27	27.28

Summaries of analyses of variance in mean rstes of occurrence of subclaussl and of clausal syntactic festures are provided in Tables 7 and 8 respectively. Tsbles 9, 10, and 11 present summaries of sub-analysaes of variance within treatment subgroups at the three age levels. As explsined earlier, the items involved in these subanalyses are only those for which the probability value st some point in Tables 7 and 8 was found to be at the .10 level or better.

Interpretstions

It has already been noted that wide age ranges within the subgroups of subjects of this study may complicate interpretstion of the language analysis that hss been performed. There are other pertinent vsriables on which information has not been availsble. The IQ factor, on which the sub-groups of children may differ remsrkably, cannot here be taken into account. No information is at hand, either, on variations in home environment, which may significantly condition language behavior. Such variables as these may quite possibly explain to some degree the differences observed in comparisons of subgroups ss small as those involved in this investigation.

Another limitation to be kept in mind is that the language corpus studied here was collected under a special set of conditions. Those condi-tions have been described earlier in this report. They were such as to call for verbalizations dependent on both the children's perceptions as they viewed films and on their memory of what they had seen. The presence of tape recorder and microphone may also have affected some of the children as distractions or inhibitors. Transcriptions of interviews, particularly those with the youngest subjects, rsther frequently included interviewers' explanations and assurances relsting to the recording equipment, as well

Table 7

Mean Total Wordage in Multiple-Word T-Units, Mean Length of Such Units, and Mean Rates of Use of Subclausal Syntactic Structures Per 100 Multiple-Word T-Units: Summary of Analyses of Variance for Age and Treatment Groups

Variable	Age Groups Mean Sq. (df = 2)	F	Treatment Groups Mean Sq. (df = 2)	F	Age X Treatment Mean Sq. (df = 4)	F	Error Within Mean Square (df = 75)
Mean total wordage	56725.26	3.68**	1242.56	.08	22107.33	1.43	15403.33
Mean length of T-units	10.83	.28	40.02	1.03	21.85	.56	38.78
Expletive cats.	6.23	1.67	.65	.17	6.50	1.74	3.73
Indirect objects	40.69	3.52**	4.00	.34	18.45	1.60	11.56
Non-clausal modifiers of nominals	692.38	2.65*	4.33	.02	334.10	1.28	261.38
Adjectives	8.97	.16	41.62	.74	106.14	1.89	56.15
Noun adjuncta	16.25	.71	26.96	1.18	16.85	.74	22.86
Appositives	5.27	1.03	6.64	1.30	5.00	.98	5.11
Genitive forms	65.11	1.30	11.44	.23	21.85	.43	50.15
Participles	2.72	.74	2.99	.82	2.29	.63	3.65
Phrases	139.61	6.27**	23.94	1.07	49.70	2.23*	22.27
Prepositional	45.60	3.75**	13.15	1.08	30.81	2.53**	12.17
Participial	17.18	4.67**	.64	.17	1.39	.38	3.68
Infinitive	7.51	3.10**	5.32	2.19	3.29	1.36	2.42
Nominalizations of verbs	86.88	2.58*	2.74	.08	24.61	.73	33.62
Gerunds	5.16	.60	6.85	.80	8.76	1.02	8.54
Infinitives	46.74	2.15	25.66	1.18	7.19	.33	21.69
Infinitive complements of non modal verbs	75.37	2.72*	49.04	1.77	19.57	.71	27.70
Adverbials of manner	7.69	1.13	2.73	.40	10.00	1.47	6.81
Single words	4.16	.95	10.56	2.41*	5.91	1.35	4.38
Preposition phrases	1.09	.38	3.24	1.13	2.94	1.02	2.87
Sentence adverbials	91.07	1.78	13.78	.27	15.22	.30	51.05
Coordinations	251.06	1.36	59.63	.32	224.26	1.22	184.24
Nominals	57.05	4.38**	51.70	3.97**	21.92	1.68	13.03
Adjectivals	1.55	.59	.87	.33	2.91	1.10	2.64
Adverbials	3.55	.87	6.48	1.59	2.21	.54	4.07
Predicates	111.50	.74	60.06	.40	133.72	.89	150.20

*Significant at the .10 level.
**Significant at the .05 level.

Table 8

Mean Rates of Use of Clausal Syntactic Structures Per 100 Multiple-Word T-Units: Analyses of Variance in Age and Treatment Groups

Variable	Age Groups Mean Sq. (df = 2)	F	Treatment Groups Mean Sq. (df = 2)	F	Age X Treatment Mean Sq. (df = 4)	F	Error Within Mean Square (df = 75)
Subordinate Clauses	178.90	1.46	109.57	.98	193.74	1.58	122.67
Noun Clauses	16.63	.66	6.64	.26	58.51	2.33*	25.07
Adjective Clauses	12.72	.67	33.08	1.76	8.17	.43	18.82
Without intro. word	3.95	.26	19.37	1.30	8.46	.57	14.93
Adverbial Clauses	135.28	2.84*	13.69	.29	26.41	.55	45.54
Time	16.23	.96	19.88	1.18	4.64	.27	16.83
Place	.09	.54	.27	1.59	.09	.54	.17
Manner	.41	1.00	.44	1.08	.19	.45	.41
Cause	46.67	2.49*	13.15	.70	6.26	.33	18.74
Condition	.63	1.46	.05	.11	.62	1.43	.43
Comparison	.18	2.13	.04	.53	.04	.53	.08
Purpose	1.01	1.33	.71	.94	.54	.70	.76
Result	.20	2.07	.06	.57	.06	.57	.10
Other	.51	.76	.51	.75	.81	1.20	.67
Coordination of T-Units	1860.76	5.43**	86.79	.25	62.59	.18	342.51

*Significant at the .10 level.
**Significant at the .05 level.

Table 9

Subanalyses of Variance in Rate of Use of Selected Syntactic Structures for Treatment Subgroups of Age Group 1

Variable	Mean Squares (df = 2)	F	Error Within Subgroups Mean Squares (df = 26)
Total words in multiple-word units	7848.37	.51	15094.69
Mean length of T-units	34.52	.48	72.09
Indirect objects	20.20	4.30**	4.70
Non-clausal modifiers of nominals	385.89	1.26	306.13
Phrases	19.72	1.88	10.48
Prepositional	13.22	1.66	7.94
Participial	.10	.95	.10
Infinitive	.68	.60	1.13
Nominalizations of verbs	15.91	.65	24.27
Infinitive complements of non-modal verbs	17.75	.60	29.67
Single-word adverbials of manner	16.98	2.05	8.26
Coordinations of nominals	3.67	.36	10.30
Noun clauses	74.08	3.85**	19.24
Adverbial Clauses	14.46	.25	56.66
Cause	12.99	.94	13.77
Coordinations of T-units	182.00	.91	200.34

*Significant at the .10 level.
**Significant at the .05 level.

Table 10

Subanalyses of Variance in Rate of Use of Selected Syntactic Structures for Treatment Subgroups of Age Group 2

Variable	Mean Squares (df = 2)	F	Error Within Subgroups Mean Squares (df = 25)
Total words in multiple-word units	34246.51	1.80	18992.15
Mean length of T-units	50.27	1.28	39.27
Indirect objects	.42	.03	13.30
Non-clausal modifiers of nominals	138.90	.64	216.08
Phrases	7.77	.34	22.85
Prepositional	6.14	.36	16.94
Participial	.16	.05	3.31
Infinitive	.08	.40	.20
Nominalizations of verbs	4.58	.19	24.48
Infinitive complements of non-modal verbs	16.53	.48	34.20
Single-word adverbials of manner	5.43	2.82*	1.92
Coordinations of nominals	33.41	2.44*	13.68
Noun clauses	46.34	1.66	27.80
Adverbial Clauses	35.32	.98	36.12
Cause	4.57	.25	18.08
Coordinations of T-units	18.47	.07	270.86

*Significant at the .10 level.
**Significant at the .05 level.

Table 11

Subanalyses of Variance in Rate of Use of Selected Syntactic Structures for Treatment Subgroups of Age Group 3

Variable	Mean Squares (df = 2)	F	Error Within Subgroups Mean Squares (df = 24)
Total words in multiple-word units	1964.75	.16	11998.55
Mean length of T-units	.38	.17	2.17
Indirect objects	20.51	1.19	17.17
Non-clausal modifiers of nominals	149.15	.57	260.07
Phrases	93.05	2.70*	34.43
Prepositional	53.86	4.58**	11.77
Participial	3.09	.39	7.94
Infinitive	10.80	1.76	6.14
Nominalizations of verbs	30.98	.58	53.27
Infinitive complements of non-modal verbs	51.82	2.76*	18.80
Single-word adverbials of manner	1.75	1.74	1.01
Coordinations of nominals	56.90	3.71**	15.32
Noun clauses	3.72	.13	28.54
Adverbial Clauses	14.47	.29	49.55
Cause	7.91	.32	24.83
Coordinations of T-units	11.81	.02	571.15

*Significant at the .10 level.
**Significant at the .05 level.

as requests that the children "speak up" or that they should not just nod or shake their heads. One advantage of the research procedure adopted was that it provided a uniform stimulus for the language behavior to be studied; there is, therefore, a common basis for comparisons. The language samples obtained, however, do not necessarily show what the children's speech may be under other stimulus conditions.

It must be recognized, too, that this study does not deal with all the aspects of language that might be of interest. It did not assess vocabularies, it did not report on articulation or other aspects of pronunciation, and it did not concern itself with grammatical forms of words or matters that are traditionally referred to as problems of usage. Though it recorded certain features of language behavior that simply reflect fluency, it focused attention on the children's syntax. Even in this area, of course, the intent was not to produce an exhaustive analysis but to attend to features most likely to indicate the children's degree of control of the syntactic resources of their language.

Fluency

Linguistic fluency is obviously impeded by indulgence in audible pauses and syntactic garbles. The relation between such indulgence and other aspects of language control, however, is by no means clear. Little study has been given to children's audible pauses, but Riling (1965) has noted that among 4th and 6th graders whom she studied, the incidence of garbles seemed an unreliable index to general maturity in their use of language. O'Donnell, Griffin, and Norris (1967) observed, in their report on the language of children in Tennessee that, under comparable conditions, 7th graders produced almost as many garbles as kindergarten children, and

that 2nd and 3rd graders produced a great many more. They reported extremely wide divergences between individuals at each of the six age-grade levels they studied, and concluded it was impossible to draw from group data on garbles any very useful generalizations.

The present study supports the findings of Riling and the Tennessee investigators. Table 1 shows the same kind of wide individual variation in production of garbles observed by O'Donnell, Griffin, and Norris, and it appears to reveal no meaningful pattern in the group means. The individual summaries from which Table 1 is drawn, moreover, show that high frequency of garbles characterized some of the otherwise most competent speakers. For example, more than one third of the garbles recorded for Subgroup A1 were produced by the boy who on almost every other count demonstrated linguistic superiority over the other children in the group.

The wide individual divergences in production of audible pauses and the scatter in subgroup means of their occurrences suggest that they too have little significance in the differentiation of subgroups. Of both garbles and audible pauses it can probably be said that though a few of the children indulged in them excessively, their total production was normal for a group of 84 preschoolers.

The high frequency of single-word expressions of assent or dissent and the incidence of other one-word responses, reported in Table 1, reflect more clearly a common lack of fluency in the language behavior studied here. These responses were generated by persistent questioning and cueing of the interviewers. The behavior of interviewers probably was, in most instances, reaction to the children's reluctance to talk about what they had seen. When it is observed that one-word responses

were generally most frequent in the two younger age groups (with the notable exceptions of Subgroups B2 and C3), this assumption leads to the query of whether the stimulus situation exploited in this investigation is appropriate for children much below six years of age. It is also possible, however, that the particular children studied here have not had sufficient benefit from situations in which they have been encouraged to talk freely about what they have seen. Perhaps their training should involve more opportunities of the sort presented to them in this assessment effort.

The incidence of one-word responses does not consistently differentiate subgroups of children given varied interventional treatment. However, Table 2 shows that in the two older age groups single-word responses of assent or dissent most frequently occurred among children who had had Treatment C. In the lowest age range such responses were most frequent in Subgroup A1, but a large share of them is attributable to two individuals.

A high rate of production of grammatically incomplete T-units may also be reasonably taken to indicate lack of fluency. In this study, computation of incidence of incomplete T-units excluded one-word responses. Table 3 reports the percentage of multiple-word units (those consisting of two or more words) that were syntactically incomplete. Inspection of that table shows that the lowest ratios of incomplete T-units were found in the speech of Subgroups A1, A3, B2, and B3, while the highest ratio was that of Subgroup C1. These facts may suggest treatment effect, but the great individual variation within subgroups dictates caution in offering this interpretation. The generally high ratio of incomplete T-units in the

speech of the West Virginia children is indicated by the fact that only 9.90 per cent of T-units produced under similar stimulus conditions by kindergarten children in Tennessee were grammatically incomplete (O'Donnell, Griffin, and Norris-1967, p. 76).

Though word production (volubility) may be distinguished from fluency, it will here be discussed under this heading. In this study, computation of total wordage excluded one-word responses, following the practice of the investigation reported by O'Donnell, Griffin, and Norris (1967). The subgroup means of total words in multiple-word units shown in Table 3 may be compared with the mean wordage of 209.4 in speech production of Tennessee kindergarten children (O'Donnell, Griffin, and Norris-1967, p. 43). It must be remembered, however, that West Virginia interviewers, unlike those involved in the Tennessee study, usually led their children persistently through a long series of questions and cues.

It is possible that treatment effect is shown in the youngest age group by the notably greater word production of children who had been subjected to Treatment A, though no general variance in this respect among the three types of treatment was statistically significant. The lowest mean wordage is found in the speech of Subgroup C1. It is to be expected that older children are the more voluble, as they generally proved to be in this study, though the mean for Subgroup A2 is lower than that for Subgroup A1. The total word production of the oldest age group was higher than that of either of the other two, and the difference is significant at the .10 level.

Syntactic Control:
T-unit Length; Coordination of T-units

In discussing word-length of T-units in the West Virginia language samples, it should be kept in mind that both complete and incomplete units are involved, but that one-word responses are excluded.

Hunt (1965) and O'Donnell, Griffin, and Norris (1967) have shown that mean length of T-units is a good measure of children's relative maturity in syntactic control. Inspection of Table 3 will show, however, that it does not very sharply differentiate subgroups involved in this study. In the youngest age group, it is true, both subgroup means and ranges of individual means indicate distinct superiority in Subgroup A1. (The maximum figure of 9.00 in the C1 range should be disregarded, for it was the single complete T-unit produced by one of the children.) On the other hand, the mean of Subgroup A2 was the lowest among those of the middle age group, and means in the oldest age group are uniform. A possible conclusion suggested by these data is that Treatment A had a superior developmental effect on very young children but, in the respect considered here, at least, it did not distinguish itself when applied to older children. The evidence for such a conclusion, however, is not statistically significant.

One reason for using the T-unit rather than the "sentence" as the basic unit of measurement in the study of children's language is that, as Hunt (1965) has demonstrated, young children characteristically lengthen their sentences by excessive coordination of independent clauses, and the least competent are likely to indulge in the practice most frequently. The percentages of independent clauses introduced by coordinating conjunctions in the language samples studied here are shown as the last item

in Table 6. Little general importance can be attached to information to be found there. The high percentage for Subgroup A3 is largely accounted for by two children. All the subgroup percentages are low in comparison to that of Tennessee kindergarten children studied by O'Donnell, Griffin, and Norris (1967), but that is probably explained by the fact that the West Virginia children much less frequently produced uninterrupted narrative accounts of what they had seen. It will be noted that the youngest age group studied here used the fewest coordinations of T-units, but this fact is in line with the evidence of the Tennessee investigators that children tend to increase use of such coordination with advances in age up through the fifth grade.

Syntactic Control: Simple Structures

Not unexpectedly, the children studied showed themselves perfectly capable of using both negative words and negative contractions, though their implied negations (as in "I doubt it" or "He could hardly see") were so few that they have not been entered in Table 4. The high frequency of elliptical negations contributes to the accumulation of one-word responses that has been noted as evidence of lack of fluency. Many other negatives were also keyed to interviewers' questions and positive urgings. Any differences between subgroups in use of negations is probably accounted for by interviewers' behavior.

Little can be said about the incidence of questions except that it was somewhat higher in the two older age groups. Even here, there is the exception of Subgroup A3. Probably no significance is to be attached to this item, except that the record shows (as could be expected)

that all subgroups were capable of questioning. The common stimulus conditions were not such as to make questions uniformly appropriate.

Those conditions, however, might well have elicited frequent expletive expressions (such as "There was an ant"). The low incidence of expletives may reflect undeveloped language performance in the children generally; no subgroups markedly distinguished themselves in use of them, though subgroup C3 produced them most frequently. Neither Age Group nor Treatment Group variances were statistically significant.

Indirect objects identify the simple structure that most clearly differentiates subgroups within two of the age ranges. Subgroup A1 used indirect objects notably more often than did other children in the youngest age group, and the difference was significant at the .10 level. Among the oldest children, Subgroup C3 was nonsignificantly distinguished by its more frequent use of the structure. If use of indirect objects is a sign of relative maturity in language production, and if the performance of Subgroup A1 is, at this point, attributable to the educational intervention, it can be said once more that the "package treatment" may be distinctly effective with the youngest children but not with the older ones.

It should be noted that passive constructions, introductory adverbials with inverted subjects, and expanded phrasal verbs occurred so infrequently in the language samples that records of them were not entered in the tables. The first and third of these three constructions might well have been expected more frequently in language of subjects in the age ranges represented. The construction involving subject inversion is probably not to be so expected.

Syntactic Control: Subclausal Complex Structures

The study of children's syntax reported by O'Donnell, Griffin, and Norris (1967) concluded that in language produced under closely comparable stimulus conditions relative incidence of subclausal complex structures such as those reported in Table 5 is an excellent index to the degree of syntactic control possessed by children. That study (pp. 56-70) reports for many of the structures dealt with here the occurrences per 100 T-units in the language production of Tennessee children at six age grade levels. Though the categories employed in the two investigations are not equivalent in detail, comparisons of their findings are possible.

Speaking generally, it can be said the oldest children in West Virginia used subclausal complex structures at about the same rate as kindergarten children did in Tennessee. It should be emphasized that this generalization is a broad one based on scanning of tables, not on painstaking study of details.

In discussion of subgroup comparisons in rates of use of non-clausal complex structures by subjects of the present study, Table 5 scores separated by less than one full percentage point will be disregarded. Under this condition, attention will be given to items on which subgroups within the three age ranges made the highest and lowest scores.

In the youngest age range, most of the differences in rates of use to be noted favor Subgroup A1. On no recorded item did it have a lowest score, and it achieved the highest rates of use of non-clausal modifiers of nominals in general, of appositives, of genitive forms modifying nominals, of phrases in general that modify nominals and particularly of prepositional phrases performing that function, of single-word adverbials

of manner, and of sentence adverbials. Highest rates of use were recorded for Subgroup C1 on use of single pre-posed adjectives, total coordinations within T-units, and coordinations of predicates, but this subgroup had the lowest of the three scores on seven items listed in Table 5. Subgroup B1 had a highest score only in rate of use of prepositional phrases as adverbials of manner, but it had lowest scores on four items. Though variance among treatment subgroups in use of subclausal complex structures nowhere attained statistical significance, the summaries of small differences may possibly support a suggestion that Treatment A was developmental in the youngest age group.

In the middle age range, however, Subgroup A2 at no point distinguished itself by highest rates of use when differences of less than one full percentage point are left out of account. On eight items its records were the lowest among those of the three subgroups. Subgroup B2 had lowest scores on three items. It had the highest scores, however, in total use of non-clausal modifiers of nominals, in use of adjectives generally and of single pre-posed adjectives in particular, in use of noun adjuncts, in use of infinitives as nominals, in use of sentence adverbials, in general use of coordinated structures within T-units and use of coordinated nominals in particular. Its rate of use of single-word adverbials of manner was considerably lower than that of Subgroup A2. Subgroup C2 led the other subgroups in its age range in rate of use of gerunds and of prepositional phrases functioning as adverbials of manner; it had no lowest scores. Differences between subgroups in the middle age

range do not dictate any very clear, consistent interpretation. All in all, however, Subgroup B2 appears to have demonstrated somewhat greater syntactic control than did the other subgroups.

The evidence on use of subclausal syntactic resources in the highest age range is also mixed. It appears, however, generally to favor Subgroup B3 and to speak least well of the syntactic control of Subgroup A3.

Subgroup A3 had the highest rate of use only of coordinated predicates. It had lowest scores on six items identified in Table 5. Its rate of use of adjectival phrases in general and of adjectival prepositional phrases in particular was, at the .05 level of confidence, significantly lower than that of the other two subgroups considered together. At the .10 level, its rate of use of coordinated nominals was significantly lower than the mean rate of the other two subgroups.

Subgroup B3 had highest scores in rates of use of adjectives in general, of infinitive modifiers of nominals, of nominalizations of verbs in general and of both gerunds and nominal infinitives, of co-ordinations within T-units in general and of coordinated nominals and adjectivals in particular. Its rate of use of coordinated nominals was significantly higher than that of either of the other two subgroups, at the .05 level of confidence.

Lowest scores on five items entered in Table 5 were recorded for Subgroup C3. It had highest scores in general use of non-clausal modifiers of nominals, of single pre-posed and post-posed adjectives, of adjectival prepositional phrases, and of infinitives in verbal expressions. It has already been noted that rates of use of adjectival

prepositional phrases and of infinitives in verbal expressions by Subgroup C3 was, at the .05 level of confidence, significantly higher than those of Subgroup A3.

It could properly be said that comparisons between subgroups ought to take account of the relative importance of the various items listed in Table 5. Selecting the entries that are most significant, a summary of highest and lowest scores within the three age ranges may be given in tabular form, still disregarding differences of less than one full percentage point.

	Age Group 1		Age Group 2		Age Group 3	
	Highest	Lowest	Highest	Lowest	Highest	Lowest
Non-clausal modifiers of nominals	A1	C1	B2	A2	C3	A3
Nominalizations of verbs	--	B1	--	A2	B3	--
Adverbials of manner	--	C1	--	B2	--	--
Coordinated structures within T-units	C1	B1	B2	A2	C3	B3

This summary does not obviously require any change in the interpretative generalizations that have been offered earlier, but it points up the lack of clarity in the picture presented by the evidence.

Syntactic Control: Subordinate Clauses

Investigators of children's language have traditionally asserted that increasing use of subordinate clauses marks advances in language control. There appears to be no reason to doubt this general notion. But O'Donnell, Griffin, and Norris (1967) have presented evidence indicating that (1) frequency of subordinate clauses in children's speech is not so clear a

reflection of relative maturity in language control as are uses of such syntactic features as those reported on here in Table 5, and (2) among the three possible types, adjective clauses are probably not dependable indicators.

These qualifications may be kept in mind when interpreting the record of production of subordinate clauses found in Table 6. In the discussion at this point, no attention will be given to the differentiation of adjective clauses on the basis whether or not they are introduced by a relative pronoun. As in the previous section, subgroup differences in rate scores will be ignored if they amount to less than one full percentage point.

Among the youngest children the general rate of production of subordinate clauses was highest for Subgroup A1. This subgroup also had, at the .05 level of confidence, a significantly higher rate of use of noun clauses than the other two subgroups had. It had no lowest scores. Subgroup B1 produced the highest score for adjective clauses and the lowest for total production of subordinate clauses and for rate of use of adverbial clauses. Subgroup C1 had the highest score for adverbial clauses relating to time and the lowest for those expressing cause. The data may suggest that least maturity in production of subordinate clauses was demonstrated by Subgroup B1 and that Subgroup A1 was somewhat superior to C1.

In the middle age range, though none of the differences attained statistical significance, Subgroup B2 was clearly the most prolific producer of subordinate clauses of all three general types and Subgroup A2 the least. It is possibly worth noting, too, that Subgroup B2 used the widest range of kinds of adverbial clauses.

Among the oldest children there were no statistically significant differences, either. The greatest production of total subordinate clauses, of noun clauses and of adverbial clauses, however was that recorded for Subgroup B3. The other subgroups match each other fairly closely, except that the C3 range of kinds of adverbial clauses was narrower than that of A3, which in this respect was similar to B3.

It would be interesting to know why Treatment B is so consistently associated with high rates of use of subordinate clauses in both of the two older age groups. Subgroups B2 and B3 used both noun clauses and adverbial clauses with relatively greater frequency than did the kindergarten children studied by O'Donnell, Griffin, and Norris (1967). For purposes of comparison, it may be useful here to note that the Tennessee kindergarten children used noun clauses at the mean rate of 5.57 per 100 T-units, while their mean rate for adjectival clauses was 4.77 and that for adverbial clauses was 6.07. In production of nominal and adjectival clauses, the overall means for West Virginia children in the two older age groups would probably approximate those of the Tennessee children. The higher frequency of adverbial clauses in the language samples from West Virginia is probably accounted for by a large number of "why" questions asked by interviewers.

Summary of Interpretations

1. The language samples studied obviously reflected a lack of fluency in the children who produced them. The method used in this investigation for eliciting language behavior may not be appropriate for the youngest children involved. It

is also possible that the children need more encouragement to talk freely about perceptual experiences and about the meanings of such experiences.

2. Individual subjects of this investigation showed extremely wide variations in behavior within every subgroup.
3. Comparisons with the report on language of Tennessee kindergarten children by O'Donnell, Griffin, and Norris (1967) indicate that, under the urging of interviewers, the older subjects of this study (taken as a whole) generally exploited the syntactic resources of the language at least as proficiently as the Tennessee children did under fairly similar conditions.
4. At numerous points the results of this study show in the youngest age group an association of Treatment A with language behavior assumed to be superior to that demonstrated by children in the other subgroups in the same age bracket. The differences are small; most of them are not statistically significant. But the accumulation of small bits of evidence is impressive.
5. There is in the data developed in this investigation little or no evidence that Treatment A produced superior results in the two older age groups. Indeed, in the relative frequency of use of subordinate clauses, Subgroup A2 was least mature.
6. In production of subordinate clauses by the two older age groups, there is an interesting association between high frequency and Treatment B.

7. Aside from production of subordinate clauses, there is little in the data developed in this study that differentiates treatment effect in the two older age groups.
8. Overall, most of the subgroup differences in means are quite small; analysis of variance shows few of them to be statistically significant.

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Appendix A

Children interviewed but not represented in this report:

Susan Workman, Subgroup A1 (not found on tapes)
Myra Lynn Jones, Subgroup A5 (not found on tapes)
Charles Houchins, Subgroup B5 (unintelligible)

Membership of the subgroups:

A1	B1	C1
Valerie Dalton	Debora B. Alderson	Doug Butler
Gloria Hall	Susan Meader	Tony Cline
Dawn Ellen Harvey	Wendy Price	Travis Matheny
Kathy Ann Vance	Teresa Wills	James T. Shrewsberry
Pamela Wright	Sarah Harmen	Aleisa Bailey
Patrick Campbell	Beth McQuillen	Lesa Carter
Jeff Clay	Phillip Bailey	Stacia Liss
John Martin Davis	Jeffrey Crawford	Debora Matheny
Bryan Riffe	Randy Fix	Tammy Saettler
Aaron Sydenstricker	Dexter Johnson	
A2	**B2**	**C2**
Kimberly O'Dell	Stephanie Ann Jones	Bill Bailey
Sherri Sloan	Debbie Meader	Anthony Lambert
Teresa D. Wickline	Connie J. McQuillen	Dean Meadows
Johnny George	Terri Price	Arnold K. Murdock
Mark Hill	Rhonda Wade	Jonathan Shepherd
James Huey	Mark Brock	Robin R. Barcly
Tommy Smith	John Lee Jenkins	Tawne Jo Lucas
David Wall	Eddie Hill	Roni Lusk
	Homer Lilly	Kimberly Martin
	Jeffrey Meadows	Neva Warren
A3	**B3**	**C3**
Rhonda Clay	Katherine L. Bailey	Linda G. Clay
Wanda Clay	Lynn Amy Berry	Barbara Cline
Bobbi Hazelwood	Rita Houchins	Dawn Liss
Laverna Lewis	Joni Rookstool	Timothy Bazzie
Jimmy Dalton	Susan Wykle	Freddy Cline
Dwight Newsome	Danny Houchins	Kevin Bailey
Thurston Connard	Mark Allen Kincaid	Michael Matheny
Mark Deeds	Michael Lilly	Timothy Matheny
Stevie Stack	Scott Edward Thompson	Richard Radford

APPALACHIA EDUCATIONAL LABORATORY--Linguistic Analysis Worksheet

Name_____ 1____Treatment Group 2,3_____Code No. in Group

4,5_____Age (in mos.) 6____Male 7____The Ant and the Dove 8,9____T-unit No.
____Female ____The North Wind and the Sun

T-UNIT:

10,11____Words in T-unit 12____T-unit Complete ____T-unit Incomplete 13____Garbles 14,15____Audible Pauses

SIMPLE STRUCTURES

16____Negations
- 17____Contracted negatives
- 18____Negative words
- 19____Implied negations
- 20____Elliptical negations

21____Questions
- 22____Yes/No questions
- 23____Wh-questions
- 24____Elliptical questions

25____Passive Constructions

26____Expletive Constructions

27____Indirect Objects

28____Intro. Adverbials with inverted subject

29____Expanded Phrasal Verbs

COMPLEX STRUCTURES

30,31_____Non-Clausal Modifiers of Nominals

32_____Adjectives (excl. pred. adj.)
- 33_____Single, pre-posed
- 34_____Pre-posed series of two
- 35_____Pre-posed series of three or more
- 36_____Single, post-posed
- 37_____Post-posed series of two
- 38_____Post-posed series of three or more

39_____Noun adjuncts

40_____Appositives

41_____Genitive forms

42_____Participles (non-phrasal)
- 43_____Present participles
- 44_____Past participles

45_____Adverbs

46_____Phrases
- 47_____Prepositional
- 48_____Participial
  - 49____Present
  - 50____Past
- 51_____Infinitive

52____Nominalizations of Verbs
- 53____Gerunds (incl. gerund phrases)
- 54____Infinitives (with and without to)

55____Infinitives (with or without to) in Verb Phrases, excluding those Associated with Modal Auxiliaries

56____Adverbials of Manner
- 57____Single words
- 58____Prepositional phrases

59____Sentence Adverbials

60____Predicate Genitives

61____Subordinate Clauses

62____Noun Clauses
- 63____With intro. words-not direct discourse
- 64____Without intro. words-not direct discourse
- 65____Direct discourse that is tagged

66____Adjective Clauses
- 67____Introduced by relative pronoun
- 68____Introduced by relative adverb
- 69____Without introductory word

70____Adverbial Clauses
- 71____Time
- 72____Place
- 73____Manner
- 74____Cause
- 75____Condition
- 76____Comparison
- 77____Purpose
- 78____Result
- 79____Other:

80____Coordinated Structures within T-unit
- 81____Nominals
- 82____Adjectivals
- 83____Adverbials
- 84____Predicates

85____Independent clauses joined by conj.

86. Analyst:

APPENDIX F

Detailed Analysis of Cognitive Growth of ECE Preschool Children

This analysis is composed of three sections. The first section includes the Curriculum Specific Test, Part Two (composed of 61 items) as the criterion and intelligence as a control variable. The second section includes the Curriculum Specific Test, Part Two as the criterion and the ITPA, the Frostig, and the PPVT Pretest scores as covariates. The third section is descriptive in nature depicting how the four groups performed in terms of percentage of objectives achieved.

Analysis of the AEL Curriculum Specific Test, Part Two. For this analysis AEL Curriculum Specific Test, Part Two, post-test scores were used as the dependent variable with Peabody Picture Vocabulary Test (PPVT) pre-test raw scores used as the control variable. The correlation between the AEL Curriculum Specific, Part Two, test and the PPVT pre-test raw score was 0.54.

The hypothesis advanced prior to the analysis was:

1. The daily thirty minute television program, weekly visit to the home by paraprofessionals, and a weekly visit by a mobile van had linear effects on cognitive development of 3, 4, and 5 year old Appalachian children.

Sampling was incidental--data gathered under an earlier and different sampling plan were used. Subjects available with equal PPVT pretest raw scores were used. It was assumed all other variables were randomly distributed across all groups.

The sampling distribution was the standard error of difference between correlated means, and the statistical model was the t-test for correlated means.

Six separate analyses were conducted--four groups, each matched with every other--yielded six separate group pairs. This approach was selected since it was impossible to match on the PPVT test across all four groups simultaneously, but it was possible to match two groups at a time. The four

separate groups were (1) those S's receiving a daily thirty minute television program, a weekly thirty minute visit by paraprofessionals, and a weekly two hour visit by a mobile preschool classroom, (2) those S's receiving a thirty minute television lesson and a weekly thirty minute visit by paraprofessionals (3) those S's receiving a daily thirty minute television lesson, and those S's receiving none of the elements.

The first analysis compared a group receiving all three elements--television, paraprofessionals, and mobile van--of the program with a group receiving two elements--television and paraprofessional. The number in each group for this analysis was ten. The mean and standard deviation of the former group were 40.9 and 8.83, and for the latter they were 46.4 and 4.84. The "t" value was -.72. Since the direction of the differences was opposite to that predicted the null hypothesis of no difference between the two groups was accepted. Table I presents these data.

The second analysis compared a group receiving all three elements--television, paraprofessional, and mobile van--with a group receiving only the television element. The number in each group for this analysis was ten. The mean and standard deviation for the former were 41.6 and 7.06, and for the latter they were 36.2 and 11.28. The "t" value was +2.024, significant beyond the .01 level. The null hypothesis was rejected and the alternate hypothesis that S's receiving all three elements learned more than S's receiving only the television element. Table II presents these data.

The third analysis compared a group receiving all three elements--television, paraprofessional, and mobile van--with a group receiving none of the program elements. The number in each group was eleven. The mean and standard deviation for the former group were 37.37 and 11.62, and for the latter group they were 37.18 and 12.13. The "t" value was +0.05, not significant. The null hypothesis of no difference was accepted. Table III presents these data.

TABLE I

PPVT SCORES ON WHICH GROUPS WERE MATCHED, CURRICULUM SPECIFIC TEST SCORES, MEAN AND STANDARD DEVIATION, AND T-VALUE FOR TV+PP+VAN AND TV+PP GROUPS

Subject	PPVT RS	T_1 TV+PP+VAN	T_2 TV+PP
1	33	32	41
2	42	53	47
3	43	46	41
4	47	44	43
5	48	39	39
6	50	32	52
7	52	37	49
8	57	46	49
9	59	54	54
10	62	26	49

$\bar{x}_1 = 40.9$ $\bar{x}_2 = 46.4$

$\sigma_1 = 8.83$ $\sigma_2 = 4.84$ $t = -1.72$*

*Not significant, 1.73 required for significance at .10 level (two-tailed test)

TABLE II

PPVT SCORES ON WHICH GROUPS WERE MATCHED, CURRICULUM SPECIFIC TEST SCORES, MEAN AND STANDARD DEVIATION, AND T-VALUE FOR TV+PP+VAN AND TV GROUPS

Subject	PPVT RS	T_1 TV+PP+VAN	T_3 TV
1	23	34	17
2	30	32	26
3	36	34	22
4	47	44	30
5	48	39	39
6	52	37	41
7	54	49	48
8	57	46	50
9	59	54	39
10	63	47	50

$\bar{X} = 41.6$ $\bar{X} = 36.2$

$\sigma = 7.06$ $\sigma = 11.28$ $t = 2.024$*

*$p < .01$ (1.63 required for .01 one-tailed test)

TABLE III

PPVT SCORES ON WHICH GROUPS WERE MATCHED, CURRICULUM SPECIFIC TEST SCORES, MEAN AND STANDARD DEVIATION, AND T-VALUE FOR TV+PP+VAN AND CONTROL GROUPS

Subject	PPVT RS	T_1 TV+PP+VAN	T_4 CONTROL
1	16	20	18
2	17	19	21
3	35	27	23
4	47	44	41
5	48	39	30
6	49	28	51
7	51	50	38
8	52	37	52
9	57	46	37
10	59	54	45
11	63	47	53

$\bar{x}$ = 37.37 $\bar{x}$ = 37.18
σ = 11.62 σ = 12.13 t = 0.05*

*N.S.

TABLE IV

PPVT SCORES ON WHICH GROUPS WERE MATCHED, CURRICULUM SPECIFIC TEST SCORES, MEAN AND STANDARD DEVIATION, AND T-VALUE FOR TV+PP AND TV GROUPS

Subject	PPVT RS	T_2 TV+PP	T_3 TV
1	34	37	23
2	38	35	35
3	39	34	27
4	44	30	30
5	47	43	27
6	48	39	39
7	52	50	41
8	53	41	40
9	57	49	50
10	59	54	39

$\bar{x}$ = 41.2 $\bar{x}$ = 35.10
σ = 7.37 σ = 7.84 t = 2.77*

*P<.01 (1.63 required for .01 - one tailed test)

The fourth analysis compared a group receiving two elements--television and paraprofessional--with a group receiving only television. The number in each group was ten. The mean and standard deviation were 41.2 and 7.37 for the former group, and they were 35.1 and 7.84 for the latter group. Being significant beyond the .01 level, the "t" value was 2.77. The null hypothesis of no difference was rejected, and the alternate hypothesis that S's receiving two elements--television and paraprofessional--learned more than S's receiving only television. Table IV presents these data.

The fifth analysis compared a group receiving two elements--television and paraprofessional--with a group receiving none of the program elements. There were seven in each group. The mean and standard deviation were 42.29 and 7.89 for the former group, and 32.71 and 8.01 for the latter group. Significant beyond the .01 level the "t" value was +2.60. The null hypothesis of no difference was rejected, and the alternate hypothesis was accepted that S's receiving two elements learned more than S's receiving none of the elements. Table V presents these data.

TABLE V

PPVT SCORES ON WHICH GROUPS WERE MATCHED, CURRICULUM SPECIFIC TEST SCORES, MEAN AND STANDARD DEVIATION, AND T-VALUE FOR TV+PP AND CONTROL GROUPS

Subject	PPVT RS	T_2 TV+PP	T_4 CONTROL
1	34	37	30
2	39	34	21
3	47	33	41
4	48	39	30
5	52	50	25
6	57	49	37
7	59	54	45
		$\bar{x}$ = 42.29	$\bar{x}$ = 32.71
		σ = 7.89	σ = 8.01
		t = 2.60*	

*P<.01 (1.86 required for .01 - one tailed test)

Finally, the sixth analysis compared a group receiving only television with a group receiving none of the program treatments. The number of paired observations was ten. For the former group the mean and standard deviation were 35.7 and 8.26, and for the latter group they were 32.8 and 10.25. The calculated "t" value was +1.16, significant beyond the .05 level. The null hypothesis of no difference was rejected, and the alternate hypothesis that S's receiving television instruction learned more than S's receiving none of the program elements was accepted. Table VI presents these data.

TABLE VI

PPVT SCORES ON WHICH GROUPS WERE MATCHED, CURRICULUM SPECIFIC TEST SCORES, MEAN AND STANDARD DEVIATION, AND T-VALUE FOR TV AND CONTROL GROUPS

Subject	PPVT RS	T3 TV	T4 CONTROL
1	22	21	23
2	34	31	30
3	39	27	21
4	45	32	23
5	47	32	41
6	48	39	30
7	52	41	25
8	57	45	37
9	59	39	45
10	63	50	53
		$\bar{x}$ = 35.7	$\bar{x}$ = 32.8
		σ = 8.26	σ = 10.25
		t = 1.16*	

*P<.05 (1.13 required for .05 - one tailed test)

Analysis of the Appalachian Preschool Test using the Illinois Test of Psycholinguistic Abilities, Frostig Developmental Test of Visual Perception, and the Peabody Picture Vocabulary Test as Covariates.

In the previous analysis, the criterion used was Part II of the Appalachian Preschool Test. Intelligence was controlled by matching subjects according to the PPVT pretest raw scores, and comparing the four groups, two groups at a time, for a total of six comparisons. This analysis indicated that those subjects receiving the television, paraprofessional, and van treatment, and those subjects receiving the television and paraprofessional treatment, were achieving significantly more than those subjects receiving the television and the control treatment. In order to accomplish this analysis, the number of subjects in each analysis had to be reduced considerably. Since pretest scores were available from the ITPA, the PPVT, and the Frostig, it was decided to run a factorial analysis of covariance using the four parts and total test scores of the Appalachian Preschool Test, and using the ITPA, Frostig, and PPVT as covariates.

Table VII contains the analysis of covariance summary tables for the four APT subtest and the total APT test. In every analysis the treatment effect was statistically significant at or above .012 level. In addition, in Subtest Two, which was the most highly developed part of the four parts of the subtest, there was a treatment by age by sex interaction significant at the .013 level. In Subtest Four the treatment by age interaction was significant at the .04 level, and the age by sex interaction was significant at the .001 level.

Table VIII is a correlation matrix showing the correlations between the ITPA, Frostig, and PPVT total pretest scores with the Appalachian Preschool Subtest and total test scores. All the correlation coefficients are very high with the exception of those with Subtest Three, which are .07, .16, and .26. The correlations between the ITPA, Frostig, PPVT pretest scores with the APT Subtest Two, were .62, .47, and .53 respectively. This subtest was more

TABLE VII

Analysis of Covariance of Scores on Appalachian Pre-School Test (APT) with 3 covariates (ITPA, Frostig, PPVT Pretest Raw Score)

APT Subtest 1

Source	SS	DF	MS	F	P
Regression	226.	3	75.193	17.990	.001
Treatment	48.6	3	16.2	3.88	.012
Age	3.29	2	1.64	0.393	
T X A	38.3	6	6.39	1.53	
Sex	13.8	1	13.8	3.31	
T X S	0.570	3	0.190	.046	
A X S	1.61	2	0.803	0.192	
T X A X S	1.73	6	0.288	.068	
Within Cells	372.005	89	4.180		

APT Subtest 2

Source	SS	DF	MS	F	P
Regression	2550.	3	850.047	28.342	.001
Treatment	1940.	3	646.	21.5	.001
Age	102.	2	50.9	1.70	
T X A	149.	6	24.8	0.827	
Sex	5.28	1	5.28	0.176	
T X S	103.	3	34.4	1.15	
A X S	33.1	2	16.6	0.552	
T X A X S	517.	6	86.2	2.87	.013
Within Cells	2669.297	89	29.992		

APT Subtest 3

Source	SS	DF	MS	F	P
Regression	21.9	3	7.301	1.963	
Treatment	55.3	3	18.4	4.95	.003
Age	19.9	2	9.97	2.68	
T X A	20.2	6	3.37	0.905	
Sex	.002	1	.002	.000	
T X S	19.5	3	6.51	1.75	
A X S	18.8	2	9.38	2.52	
T X A X S	21.8	6	3.64	0.978	
Within Cells	331.065	89	3.720		

TABLE VII (Contd.)

APT Subtest 4

Source	SS	DF	MS	F	P
Regression	105.	3	35.076	14.434	.001
Treatment	87.9	3	29.3	12.1	.001
Age	1.77	2	0.887	0.365	
T X A	33.0	6	5.50	2.27	.04
Sex	0.237	1	0.237	.097	
T X S	12.6	3	4.20	1.73	
A X S	22.9	2	11.5	4.72	.011
T X A X S	19.2	6	3.19	1.31	
Within Cells	216.272	89	2.430		

APT Subtest Total

Source	SS	DF	MS	F	P
Regression	6070.	3	2024.136	35.325	.001
Treatment	3990.	3	1330.	23.2	.001
Age	300.	2	150.	2.62	
T X A	584.	6	97.3	1.70	
Sex	55.9	1	55.9	0.975	
T X S	296.	3	98.6	1.72	
A X S	241.	2	120.	2.10	
T X A X S	706.	6	118.	2.05	
Withi. Cells	5099.795	89	57.301		

TABLE VIII

CORRELATION MATRIX OF ITPA, FROSTIG AND PPVT TOTAL PRETEST SCORES WITH APPALACHIAN PRESCHOOL SUBTESTS AND TOTAL TEST SCORES

	Appalachian Preschool Test				
	Subtest #1	Subtest #2	Subtest #3	Subtest #4	Total
ITPA	.68	.62	.16	.49	.71
FROSTIG	.48	.47	.07	.34	.50
PPVT	.47	.53	.26	.52	.65

systematically developed. Therefore, these correlations are more significant. The correlations between the ITPA, Frostig, PPVT Total pretest scores, and the APT total test score were .71, .50, and .65 respectively. These are very significant correlations since the reliability coefficient for the APT was .92.

Table IX contains the means, the standard deviations, and standard errors for each Appalachian Preschool Test Subtest by treatment. Subtest Two is more significant since it contains more items, and these items were subjected to item analysis and revised before used in the target population. For this subtest the mean was 43.7 out of a total possible score of 61. The second highest was achieved by the television, paraprofessional, van group being 36.26. The third highest was achieved by the television group receiving 32.25, and the fourth highest was that achieved by the control group, being 31.27.

The adjusted means were not available for this report. The unadjusted means indicate that the group receiving television and paraprofessional performance was significantly more than the next highest group, which was in the television, paraprofessional, and van group. A t-ratio calculated between these two groups was found to be 10.62, significant beyond the .01 level. A t-ratio calculated between the group receiving the three elements and the group receiving only the television element was significant beyond the .01 level of significance.

TABLE IX

MEANS AND STANDARD DEVIATIONS AND STANDARD ERRORS FOR EACH APT SUBTEST BY TREATMENT

APT I (16 items)

	TV+PP+VAN	TV+PP	TV	CONTROL
n	34	29	32	26
$\bar{x}$	11.76	13.45	12.25	11.69
SD	3.50	1.79	2.70	2.55
SE	0.61	0.34	0.48	0.51
$SE_{.95}$	0.69	0.66	0.95	1.00
$SE_{.99}$	1.57	0.87	1.23	1.32

APT II (61 items)

	TV+PP+VAN	TV+PP	TV	CONTROL
n	34	29	32	26
$\bar{x}$	36.26	43.17	32.25	31.27
SD	9.28	6.58	9.73	10.68
SE	1.62	1.24	1.75	2.14
$SE_{.95}$	3.18	2.43	3.43	4.19
$SE_{.99}$	4.18	3.20	4.52	5.52

TABLE IX (Contd.)

APT III (8 items)

	TV+PP+VAN	TV+PP	TV	CONTROL
n	34	29	32	26
$\bar{x}$	4.91	5.60	4.40	1.5
SD	1.90	2.10	2.20	3.2
SE	0.33	0.40	0.39	0.64
$SE_{.95}$	0.65	0.78	0.77	1.24
$SE_{.99}$	0.85	1.03	1.00	1.65

APT IV (10 items)

	TV+PP+VAN	TV+PP	TV	CONTROL
n	34	29	32	26
$\bar{x}$	8.0	9.1	7.2	6.3
SD	1.6	1.3	2.4	2.9
SE	0.28	0.25	0.43	0.58
$SE_{.95}$	0.54	0.49	0.84	1.14
$SE_{.99}$	0.72	0.65	1.11	1.50

The third analysis using selected items from Part II of the Appalachian Preschool Test of Cognitive Skills.

The van was available for only the last three months of operation of the first year. For that period of time the behavioral objectives which were used as the primary objectives for developing the instructional materials were identified, and the items of the Appalachian Subtest II used to measure those objectives were identified. Those objectives rated as secondary were not included for analysis. For that period of time ten items were identified as being directly correlated with primary objectives during the last three months.

The criterion was the percentage of individuals who correctly responded to the test items. The performance criterion for the program is that a child after going through three years of the preschool program will achieve 90 percent of the behavioral objectives.

Assuming that these ten items are a random sample of objectives used, estimates can be obtained on the number of subjects in the program achieving performance criterion. In general the subjects in the group receiving television and paraprofessionals are already achieving criterion. Ninety percent of the subjects in this group are getting these ten items correct.

In the remaining three groups, approximately seventy-five percent of the subjects are getting the selected items. This is a difference of approximately fifteen percentage points or on the average fifteen too many out of a one hundred are failing to achieve criterion.

The average intelligence quotient was 111 for the group receiving all three elements, 112 for the group receiving two elements, 104 for the group receiving one element, and 99 for the comparison group. For all practical purposes the intelligence is the same with the exception of the comparison group.

The group receiving the television and paraprofessional elements achieved criterion in four items or 40% of the items. The group receiving the television element achieved criterion in three items or 30% of the items. The comparison group achieved criterion on four of the items or 40 percent of the items.

On two of the items all subjects across all four groups achieved criterion. This indicates that preschoolers know terms dealing with simple size relationships (Item 4), and know how to relate number use with objects. The most difficult objective to achieve was time related items. Operationally this means it is very difficult for preschoolers to associate time with a calendar.

Table X presents the item numbers, the percentage achieving criterion, the mean percentage achieving criterion for each group and the average IQ for each group.

Discussion

The hypothesis being tested was that a daily thirty minute lesson, a weekly thirty minute visit by a paraprofessional, and a weekly two hour visit by a mobile preschool classroom with a professional and a paraprofessional, would have additive effects on learning.

From the analyses it is safe to conclude that the thirty minute daily television lesson does have a true effect, and that the weekly half-hour visit by a paraprofessional has an additional true effect when used in conjunction with the daily television lesson. The available data prevents any conclusions concerning the independent additive effects of the paraprofessionals and the mobile preschool classroom.

The surprising result was the lack of any effects attributable to the mobile classroom with a professional and a paraprofessional. There are some

TABLE X

THE NUMBER OF THE ITEMS IN SUBTEST II OF THE APPALACHIAN TEST FOR COGNITIVE SKILLS WHICH CORRELATED DIRECTLY WITH THE PRIMARY BEHAVIORAL OBJECTIVES USED FOR PROGRAMMING DURING MARCH-MAY 1969 IN THE ECE PROGRAM

Item Number	Package	TV+PP	TV Only	Control	Mean Percentage getting item correct
4	.97	1.00	1.00	.96	98.25
5	1.00	1.00	.97	.96	98.25
11	.74	.93	.81	.96	86.00
19	.65	.86	.72	.77	75.00
26	.79	.93	.78	.65	78.75
30	.56	.86	.69	.62	68.25
31	.91	.83	.81	.96	87.85
34	.91	.86	.59	.58	73.50
56	.85	1.00	.94	.73	88.00
57	.32	.76	.09	.38	31.25
	$\bar{x} = .77$	$\bar{x} = .90$	$\bar{x} = .74$	$\bar{x} = .73$	
	$\bar{x}_{IQ} = 111$	$\bar{x}_{IQ} = 112$	$\bar{x}_{IQ} = 104$	$\bar{x}_{IQ} = 99$	

factors, when considered, that help explain why this could have occurred. First, the van was used only for the last three full months of the eight months of operation. This could have contributed to the van showing up as it did. Second, the measure used consisted of cognitive objectives, and the van was designed for orienting and attending objectives. This raises a question of test relevancy concerning the van meaning that the van was accomplishing objectives not being measured by the test.

Although no data have been gathered on experimental attrition, preliminary estimates suggest that some students in the group receiving the van do not attend regularly, and some attend the van, but do not view the television program. This also could explain why the van showed no additive effects.

Another hypothesis is that the interface between the paraprofessional and van elements is not as expected. The idea originally was that the van and paraprofessionals would reinforce the instruction provided by television. It could be that parents of the children in the van group spend less time with their children on the assumption that what the children get in the van is sufficient. The parents of children in the group receiving only the television and paraprofessionals could be spending more time working with their children since they have no feeling of interfering with what the professional is doing in the van. If these hypotheses are credible, then the interface between the van and paraprofessional element requires some further study.

Still another hypothesis is that role perception of the van personnel and the paraprofessionals may be affecting the performance. The paraprofessionals entering the home is a different situation than the children entering the van to meet with the van teacher.

Appendix G

Tabulation of Parent

Attitude Questionnaire

	PACKAGE				TV+VISITOR				TV			
	3	4	5	Total	3	4	5	Total	3	4	5	Total
(1) How often, on the average, did your child watch the TV program "Around the Bend?"												
Five days per week	14	20	16	50	14	17	19	50	5	14	4	23
Four Days per week	17	16	18	51	9	11	18	38	7	9	11	28
Three days per week	7	1	6	14	7	4	4	15	13	5	6	24
Two days per week	1	-	1	2	2	2	-	4	7	8	3	18
One day per week	1	-	1	2	-	-	-	-	1	1	3	5
Less than one day	-	1	1	2	-	1	2	3	4	7	7	18
(2) On the average, how often were you able to watch the program with your child?												
Five days per week	7	13	8	28	7	10	13	30	3	6	1	10
Four days per week	20	14	15	49	12	8	12	32	5	5	6	16
Three days per week	9	5	13	27	9	11	14	34	6	7	4	17
Two days per week	2	3	4	9	2	5	1	8	8	9	9	26
One day per week	1	1	2	4	-	1	2	3	7	9	10	26
Did not watch	1	1	1	3	-	-	2	2	1	-	-	1

	PACKAGE				TV+VISITOR				TV			
	3	4	5	Total	3	4	5	Total	3	4	5	Total
(3) Have you noticed any of the following changes in your child this year?												
(a) Plays better with other children												
YES	32	28	28	88	22	22	29	73	24	26	19	69
NO	3	4	9	16	4	5	8	17	8	11	8	27
NO RESPONSE	5	7	5	17	6	8	7	21	5	2	7	14
(b) Expresses himself better												
YES	33	32	39	104	27	26	39	92	26	36	25	87
NO	5	2	2	9	3	3	1	7	5	2	3	10
NO RESPONSE	2	5	1	8	2	6	2	10	5	5	6	16
(c) More aware of things around him												
YES	36	34	40	110	28	25	41	94	25	32	25	82
NO	3	1	1	5	-	3	1	4	4	7	5	16
NO RESPONSE	1	4	1	6	4	7	1	12	7	4	5	16
(d) Better able to do things for himself												
YES	33	34	37	104	29	25	36	90	24	33	25	82
NO	5	1	4	10	1	3	6	10	7	6	5	18
NO RESPONSE	2	4	-	6	2	7	1	10	5	4	4	13
(e) Less shy around adults												
YES	32	28	32	92	22	23	30	75	19	24	18	61
NO	7	5	8	20	6	6	9	21	11	13	5	29
NO RESPONSE	1	5	2	8	4	7	4	15	6	6	11	23
(f) Better able to follow instructions												
YES	34	36	38	108	27	30	41	98	25	32	24	81
NO	2	-	3	5	2	3	2	7	6	6	3	15
NO RESPONSE	4	3	1	8	3	2	-	5	5	5	6	16

	PACKAGE				TV+VISITOR				TV			
	3	4	5	Total	3	4	5	Total	3	4	5	Total
(g) Has learned things which are helpful in school												
YES	28	33	39	100	26	30	42	98	25	31	23	79
NO	1	-	2	3	2	2	-	4	4	5	2	11
NO RESPONSE	11	7	1	19	4	3	1	8	7	7	7	21
(4) Have you noticed any of the following changes in <u>your</u> family's life?												
(a) Understands preschool child better												
YES	31	35	36	102	26	20	34	80	18	24	20	62
NO	4	2	3	9	1	5	2	8	10	12	7	29
NO RESPONSE	4	3	2	9	4	10	9	23	8	7	8	23
(b) Reads more to the child												
YES	23	27	26	76	20	19	30	69	16	19	13	48
NO	10	8	10	28	7	6	6	19	11	19	16	46
NO RESPONSE	6	5	6	17	4	10	8	22	10	5	5	20
(c) Takes child on more trips												
YES	13	19	20	52	13	12	25	48	18	19	18	55
NO	16	12	16	44	11	11	12	34	11	17	14	42
NO RESPONSE	10	11	6	27	7	11	8	26	7	8	3	18
(d) Do more things <u>with</u> the child												
YES	25	31	32	88	20	28	32	80	18	29	18	65
NO	8	6	6	20	3	3	5	11	10	10	10	30
NO RESPONSE	6	2	4	12	8	4	7	19	7	4	6	17

	PACKAGE				TV+VISITOR				TV			
	3	4	5	Total	3	4	5	Total	3	4	5	Total
(e) Visits Bookmobile more often												
YES	4	4	4	12	2	5	7	14	3	1	4	8
NO	21	19	28	68	20	19	28	67	22	34	22	78
NO RESPONSE	15	15	9	39	9	11	8	28	11	8	8	27
(f) Spend more time in answering child's questions												
YES	31	33	38	102	27	29	38	94	27	30	29	86
NO	5	1	1	7	-	1	2	3	4	7	4	15
NO RESPONSE	4	1	2	7	3	2	3	8	5	2	1	8
(g) Talks more with child												
YES	30	36	35	101	24	28	36	88	26	23	25	74
NO	4	2	2	8	-	1	3	4	6	8	3	17
NO RESPONSE	6	2	5	13	7	6	4	17	4	3	5	12
(h) Provides more playthings of an educational nature												
YES	23	23	24	70	20	21	33	74	22	24	13	59
NO	11	6	11	28	5	3	6	14	6	15	13	34
NO RESPONSE	6	8	7	21	6	11	4	21	7	5	6	18
(5) Does your child talk to you or others about the television program?												
YES	34	33	40	107	27	32	40	99	26	33	21	80
NO	6	5	3	14	3	3	3	9	10	10	9	29
NO RESPONSE	-	-	-	-	-	-	-	-	-	1	3	4

	PACKAGE				TV+VISITOR				TV			
	3	4	5	Total	3	4	5	Total	3	4	5	Total
8) How often do you feel a home visitor should visit in the home to be most effective?												
Once a week	38	34	40	112	31	32	44	107				
Once every two weeks	1	2	2	5	-	1	-	1				
Once a month	1	1	-	2	-	-	-	-				
Not at all (Materials by mail)	-	1	-	1	-	-	-	-				
(9) How would you rate the materials that the home visitor gave you?												
Excellent	19	19	26	64	12	17	23	52				
Very good	15	16	12	43	14	11	20	45				
Good	6	3	4	13	4	5	1	10				
Fair	-	1	-	1	1	-	1	2				
Poor	-	-	-	-	-	-	-	-				
(10) How well did your home visitor explain the materials?												
Excellent	28	30	34	92	23	28	36	87				
Very good	8	8	6	22	7	5	7	19				
Good	4	-	2	6	1	-	1	2				
Fair	-	-	-	-	-	-	-	-				
Poor	-	-	-	-	-	-	-	-				

	PACKAGE				TV+VISITOR				TV			
	3	4	5	Total	3	4	5	Total	3	4	5	Total
(13) Does your child talk to you or other members of the family about the things he(she) does at the traveling classroom?												
YES	28	35	33	96								
NO	9	2	4	15								
NO RESPONSE	4	1	4	9								
(14) Have you had the opportunity to visit the traveling classroom?												
YES	24	29	24	77								
NO	12	6	15	33								
NO RESPONSE	4	3	2	9								

Sample Copy of Parent

Appendix H

Attitude Questionnaire and

Attitude Checklist

Child's Name_____

Survey

We are in the process of evaluating the Appalachia Preschool Education Program in which your child participated. You could help us make the program more effective by answering the following questions.

____3 yr. old
____4 yr. old
____5 yr. old
(Check one)

____TV only
____TV-Visitor
____TV-Visitor-Van
(Check one)

(1) How often, on the average, did your child watch the TV program "Around the Bend?"

Five days per week_____
Four days per week_____
Three days per week_____
Two days per week_____
One day per week_____
Less than one day per week_____

(2) On the average, how often were you able to watch the program with your child?

Five days per week_____
Four days per week_____
Three days per week_____
Two days per week_____
One day per week_____
Did not watch program_____

(3) Have you noticed any of the following changes in your child this year?

a. Plays better with other children	Yes___	No___
b. Expresses himself better	Yes___	No___
c. More aware of things around him	Yes___	No___
d. Better able to do things for himself	Yes___	No___
e. Less shy around adults	Yes___	No___
f. Better able to follow instructions	Yes___	No___
g. Has learned things which are helpful in school	Yes___	No___

h. Other changes (please specify)_____
_____
_____
_____

(4) Have you noticed any of the following changes in your family's life?

a. Understands preschool child better	Yes___	No___
b. Reads more to the child	Yes___	No___
c. Takes child on more trips	Yes___	No___
d. Do more things with the child	Yes___	No___
e. Visits Bookmobile more often	Yes___	No___
f. Spend more time in answering child's questions	Yes___	No___

g. Talks more with child. Yes___ No___
h. Provides more playthings of an educational nature Yes___ No___
i. Other changes (please specify)_____

_____

_____

_____

(5) a. Does your child talk to you or others about the television program?

Yes___ No___

b. If yes, what was the last thing he (she) talked about?

(6) What did you and your child like MOST about the TV program?

(7) What did you and your child like LEAST about the TV program?

(8) How often do you feel a home visitor should visit in the home to be most effective?

Once a week_____
Once every two weeks_____
Once a month_____
Not at all (materials aent by mail)_____

(9) How would you rate the materials that the home visitor gave you?

Excellent_____
Very good_____
Good_____
Fair_____
Poor_____

(10) How well did your home visitor explain the materials?

Excellent_____
Very good_____
Good_____
Fair_____
Poor_____

(11) What did you like <u>most</u> about these materials?

(12) What did you like <u>least</u> about these materials?

(13) Does your child talk to you or other members of the family about the things he (she) does at the traveling classroom?

___yes ___no

If yes, what was the last thing he (she) talked about?

(14) Have you had the opportunity to visit the traveling classroom?

___yes ___no

(15) What do you and your child like <u>most</u> about the traveling classroom?

(16) What do you and your child like <u>least</u> about the traveling classroom?

(17) Other comments.

Appalachia Educational Laboratory, Inc.

EARLY CHILDHOOD EDUCATION

NAME OF CHILD: _____

ADDRESS: _____

DATE: _____ TIME: _____

Package____ TV + Visit____ 3 yr. old____ 4 yr. old____ 5 yr. old ____

HOME VISITOR: _____

I. What was the attitude of the parent toward visit?

Cooperative 1: 2: 3: 4: 5: 6: 7: Uncooperative

II. What was the attitude of the parent toward E.C.E. Program?

Accepting 1: 2: 3: 4: 5: 6: 7: Rejecting

III. How does the mother feel about the attitude of the child toward the TV broadcast?

Interesting 1: 2: 3: 4: 5: 6: 7: Uninteresting

Worthwhile 1: 2: 3: 4: 5: 6: 7: Useless

IV. What was the attitude of the parent toward TV broadcast?

Interesting 1: 2: 3: 4: 5: 6: 7: Uninteresting

Worthwhile 1: 2: 3: 4: 5: 6: 7: Useless

V. How do parents feel about supporting materials?

Interesting 1: 2: 3: 4: 5: 6: 7: Uninteresting

Worthwhile 1: 2: 3: 4: 5: 6: 7: Useless

Enthusiastic 1: 2: 3: 4: 5: 6: 7: Polite

VI. What was the child's reaction to TV broadcast?

Attentive 1: 2: 3: 4: 5: 6: 7: Inattentive

Present 1: 2: 3: 4: 5: 6: 7: Absent

Cooperative 1: 2: 3: 4: 5: 6: 7: Uncooperatove

VII. Describe week's TV reception.

Good sound 1: 2: 3: 4: 5: 6: 7: No sound

Good picture 1: 2: 3: 4: 5: 6: 7: No picture

Working 1: 2: 3: 4: 5: 6: 7: Not working

VIII. General reactions or comments (on back).

Appendix I

Paraprofessional Attitude Data

Instrument and Results

HOME VISITOR SURVEY

1. Would you like to retain your present group of parents and children for another year or move to a different group? Why?

I would be more than happy to keep all of my parents and children as I've had a very good relationship with them all. However, I feel that I would have more to offer children in a more deprived area and would welcome the opportunity to work with some of these children and their mothers. Whatever is decided is OK with me, and I've been very pleased with both areas I visit.

I would like to retain what I have and add a few more children who receive the van. I had children who receive TV-visitor only. I would prefer a combination.

I would prefer to keep the children and parents I have. They keep asking if I'll be back next year. Have told me they hope so, and that if I'm moved they hope they don't have the home visitor that signed them up in one particular area especially. I would like to pick up more children in my areas.

Retain present group. Too much valuable time would be lost establishing a comfortable and honest working relationshi with a new group.

All but two. They've accomplished a great deal. I visits and feel most welcome.

Retain--they have been a very nice group of people to w k with. I feel welcome in the home. The children seem to enjoy my visits, and I have enjoyed my visits with them very much.

Yes, retain. It takes us a long time to become familiar with people. If I had to meet and get to know an entirely different group of parents and children, it would take that much longer to reach the plane of familiarity I am now on with my own group.

Yes. Be use I feel it would be easier to work with them.

2. What have been your major problems in working with parents and children this year?

None.

As far as I can think of I have had only two major problems--the parents being disappointed in the program for one reason or another--telling us--and nothing coming of it. (This is the parents' opinion--not mine. I felt the program improved.) The other problem was my own health. This will remedy itself the first of September.

The mix-up that time about the program being in color. Parents upset. Some children were still asking about this at the end of program, and when we'd explain a program for a certain day and then the program for that day being changed and trouble with the reception. Mother and children complained because they couldn't see the picture well.

Laxness on parents part in helping stimulate child's interest. It seemed too easy for some of them to not be present when the child needed help or advice, also some do not impress upon the child that the program is something very special just for them and instill pride in their accomplishments.

No real problems--some sleep late and miss program. 9:30 will help. If I don't get there on my usual day, they are usually gone--I've worked a couple of days when I was sick because I couldn't lose time and be able to see everyone--we need someone to fill in when we're sick.

Most parents thought the program was too early--that the children could have done better later in the morning--a few thought there were too many review programs, but there have been no major problems.

Being able to feel comfortable and relaxed with them. I have had no personality or materials problems.

1-Materials to work with child, if we were expected to do this.
2-Bad and slick roads.
3-Explaining the tests and why parents would not receive results.
4-Changes in program.

3. What suggestions would you make for the training of new Home Visitors?

About one week inservice at the office and one week in the field. The one week "in the field training" would benefit a new Home Visitor more than a month's training in the office. Child Development and Sensitivity were interesting but not that beneficial to job of Home Visitor.

I cannot honestly suggest a type of training because we didn't really learn anything until we were actually in the home doing our job. Perhaps the new home visitors might visit with the old ones for a week or two--to me they have to actually be in the home to know what they are doing.

To be able to go out for a day with another home visitor and to be told exactly what's to be done and advised at the beginning about how much testing would be done during the year so they tell the parent. I feel we're only being tolerated and some mothers have said they hoped we were about through with this testing.

Let the new Home Visitor visit homes with different old Home Visitors to see how each one works, then she would be able to establish her own routine with what hopefully would be our better points.

On the job training. Tell them what their job is and let them know when they are satisfactory as well as unsatisfactory. Don't consider women who don't enjoy children or lack patience.

A new Home Visitor would learn more if she visited the homes with a Home Visitor, a few times. The training we had was very little help to me.

That they treat each parent and each child as the individuals that they are and not be governed in their actions by stereotypes.

1-Visiting with old home visitors in homes.
2-More materials to work with.
3-Participating with children. Watching them watch movies then talking with them later.

4. What suggestions would you have for further training for Home Visitors?

I really don't have any worthwhile suggestions as I can't see where the Home Visitor's job requires much "in depth" training. I would like to see Thursdays spent more constructively but here again no good suggestions.

Unless we do more with the child in the home (like playing games, singing songs, working puzzles, etc.) what is there to learn about talking, watching a TV program, and writing. I am for a closer relationship between home visitor and child--especially the child who gets TV-visitor only.

I don't know, but if there were something to help us to be able to get more mothers to take interest and watch with the child so she'd be able to help and this would also help her to talk to us. When they go into strange areas to test not be sent out alone.

I feel that I have trained myself as Home Visitor since no guidelines were furnished in the beginning. I've done my best to fulfill the job as I see it. I'm sure there is much more I could learn and I am willing and able to do so but I think it would be up to whomever evaluates my work to know what this training is. Training for myself needed. In the group meetings: To learn the art of either keeping silent or telling people what they want to hear. (This is an example of what I mean.)

How would I know? I'm not sure I'm a good one--I'd hesitate to make recommendations--Didn't learn anything I didn't already know from Mrs. Noecker. I found two days of sensitivity training most unpleasant. For the safety of all home visitors DON'T send anyone into unfamiliar territory alone--send them in pairs.

A Home Visitor should first like children, and enjoy working with them. They must have tact, patience, and understanding of the children and mothers.

Besides a thorough knowledge of the work involved, there is nothing that can help one understand the job better than field work itself. "Further training" such as role-playing and lectures on the behavior patterns of preschool children are helpful only to a certain point and we (the present home visitors) passed that point nine months ago.

1-Materials that will be used in further programs to go over.
2-Instructions to what information you would like.

5. What would you like to see changed in the job of the Home Visitor? Be specific--name activities to be added, deleted, or revised.

Checklist on feedback sheet eliminated as I feel it is worthless and more or less an inaccurate way on which to answer questions that were presented. Things I would like to see added are copies of songs, poems, etc., so that we can reinforce these with child during visit. Less emphasis on feedback as far as so much writing. Liked checklist idea on this with added comments by home visitor (Rosemary's suggestion).

Get rid of the checksheets that we fill in 1-7. They are useless. More activities with child--extra materials and ideas we could take with us to help child. Trips to Beckley cut to once every two weeks. One boss to tell us what to do and to go to with our problems. Some set plan for snowy x ads. Women on the road in snowy weather are asking for trouble. Do not believe in sending home visitors into areas they are unfamiliar with. I ran into a situation on a lonely road last week that could have turned into a real mess. Women alone in unfamiliar territory is no good.

The method of writing the feedback. To be able to only have to come to Beckley every two weeks.

1-The checklist either simplified or required on a periodic basis.
2-On testing--be advised of the nature and number of tests to be given so as not to have strangers unexpectedly knocking on doors of our children's homes to test them--perhaps advance notice to parents or to have one person test each child through all phases.

Beckley trips cut to bare minimum--once a month. That would eliminate a lot of hurrying and give time to call back if necessary. Don't send us into another territory alone. If possible, don't send us into another territory at all. Had most unpleasant day.

The checksheets could be a little easier to fill out without so much writing. A trip to Beckley every two weeks instead of each week.

Delete the feedback sheets--if you want what the child says, tape record it. Those sheets are inaccurate, prejudicial, and useless. As far as our observations of the child go, we can see how he reacts to the program but indicating his degree of interest is again inaccurate. (This should somehow be revised.) I some-

times have felt, though the Curriculum Materials Team always deny it, that these sheets are the only thing that we accomplish that they consider worthwhile. If so, then the job of Home Visitor is useless and unnecessary. Those sheets say nothing. And anyone who believes they have merit and valuable information is deluding himself. Fortunately, I have found that a personal relationship can mean the difference between disinterest and enthusiastic participation on the part of the child and the parent. And that is what I feel I have accomplished toward the interests of the Laboratory.

1-Checklist done away with.
2-Verbal feedback.

6. In your opinion, what has been the best feature of the entire Preschool Program?

The van--as I feel this has given the 3 and 4s an opportunity to participate in a classroom situation that they would not be exposed to until age 5 when they might, if available, be able to attend kindergarten. If we had been in more isolated areas, this would have been invaluable to 5s also. TV and Home Visitor would have also been extremely worthwhile in this type area.

The close relationship within the group of workers--the field team, van teams, and the TV team. I also like the materials we deliver--Mr. Alford and Mrs. Cook and Mrs. Casali also are excellent features. Oh yes, ample sick leave--I really appreciated this. I am also very impressed with Dr. Carmichael. He always treats us like we mean something to the program--always takes time to talk--never brushes us aside.

The teaching of the numerals and letters showing the different animals and the map of Patty's neighborhood. The using the calendar. I'd like to see this used each month. If only to mention the month, day, and mark the weather for that day. The van has been very good for the ones who have it.

Personally speaking: Getting to know so many exceptionally nice people both in the staff and homes I visit and the good feeling that I am doing something worthwhile and beneficial, perhaps for the first time in my life. As for the program itself, I feel it is opening the door to education and a possible solution to many of the problems our country is facing today.

1a-The fact that mothers are working with their children and had not previously.
1b-Van and teachers.

The way all the children have learned from the program. The mothers working with their children, and their willingness to help their child to get to the van, and any other thing that helped their children.

The mobile classroom has shown the greatest overall success and this has been directly influenced by the superiority of the teacher, Mrs. Cook. Not every teacher could have handled this variable situation with the competence and aplomb Mrs. Cook showed.

1-Mobile van. Because this gave children experience with a teacher also a classroom, and other children. This is what they missed in the TV program.

7. What has been the least desirable feature of the Program?

The testing! Haven't enjoyed this at all although I realize this has to be done--as for the total program, I cannot think of anything that has been least desirable unless it would be the monotony of writing the same thing week after week after week on feedback sheets--Review programs.

Not knowing who our boss is--this testing--I had to quit my job because of the approximately 100 miles a day I had to travel to test children out of my area. I just don't see that it was necessary because we had given the other tests (we being people familiar with child) the home visitors didn't like it and the mothers didn't either. It was done for this one test simply to satisfy a Board of Directors that from what I could see the last of April--half of them didn't even know what we were doing. We are the ones who had worked in the program and done everything in our power to be as flexible as possible--it just became impossible for me to continue (being six months pregnant) therefore, someone else was stuck with doing my part. I didn't like this at all. Let's all be flexible if part of us have to be! Often things seem to get very disorganized--plans should be made and ready in ample time instead of leaving everything for the last minute--this can lead to unnecessary mistakes. I am speaking of myself too. Some of the forms are unnecessary--the questions too ambiguous.

The testing and the fact we or the parents didn't know there were to be so many. I believe if these could have been spaced apart it would have been better (and the results). I know we need some of these on the letters and numerals.

Too much writing. I find it impossible to write a complete feedback while visiting and talking with parent and child also viewing the child's accomplishments to praise and encourage him or her. I feel rude to ignore them and keep writing so, therefore, I spend three to four hours at night with my notes reconstructing and writing feedback that I gathered throughout the day. More complaints on reviews than anything else. Most of my group just didn't watch reviews.

1-Too many review programs.
2-Too much time spent on one letter or numeral.
3-Letters printed on thin paper tend to make child trace the letter and write an entire page of the letter backwards when he turns it over. Use construction paper please.

The least desirable thing about the program was trying to get the materials to the children in bad weather and having some of the programs changed. All the testing is not too desirable either.

The TV program itself--generally. It's inconsistent quality of material and content, incompetence of it's producers and participants--specifically.

1-To have to make a choice between home visitors.
2-The checklist.

Concerning your part in the Early Childhood operation, how do you feel about -

I. Your Relations with the parents.

Interesting	4:4:__:__:__:__:__	Dull
Pleasant	5:3:__:__:__:__:__	Unpleasant
Worthwhile	4:4:__:__:__:__:__	Useless
Spent more time with parent	__:3:1:4:__:__:__	Spent more time with child
Talked a great deal	4:1:1:2:__:__:__	Talked very little
Talked directly about TV program	__:__:1:5:2:__:__	Talked about things related to program
Too time consuming	__:__:2:4:1:1:__	Not enough time
Required more program materials	3:1:1:2:1:__:__	Required less program materials
Personal	4:__:3:__:1:__:__	Businesslike

II. Your Relations with the Television Production

Interesting	4:3:__:__:__:1:__	Dull
Pleasant	5:2:__:__:1:__:__	Unpleasant
Worthwhile	4:2:__:__:1:__:__	Useless
Spent more time with parent	__:2:2:3:1:__:__	Spent more time with child
Talked a great deal	2:1:__:5:__:__:__	Talked very little
Talked directly about TV program	__:__:3:4:__:1:__	Talked about things related to program
Too time consuming	__:2:1:3:2:__:__	Not enough time
Required more program materials	__:2:4:1:1:__:__	Required less program materials
Personal	2:2:1:2:1:__:__	Businesslike

III. Your Relations with the Mobile Classroom Operation

Interesting	4 : 2 : 1 : __ : __ : __ : __	Dull
Pleasant	4 : 3 : __ : __ : __ : __ : __	Unpleasant
Worthwhile	6 : 1 : __ : __ : __ : __ : __	Useless
Spent more time with parent	__ : __ : 3 : 2 : __ : __ : 1	Spent more time with child
Talked a great deal	__ : __ : 3 : 1 : 1 : 2 : __	Talked very little
Talked directly about TV program	__ : __ : 1 : 4 : 1 : __ : 1	Talked about things related to program
Too time consuming	__ : 1 : __ : 2 : 1 : 1 : 2	Not enough time
Required more program materials	1 : __ : 3 : 3 : __ : __ : __	Required less program materials
Personal	1 : 2 : 2 : 2 : __ : __ : __	Businesslike

IV. Your Relations with the Children to whom you were Assigned.

Interesting	6 : 1 : 1 : __ : __ : __ : __	Dull
Pleasant	6 : 2 : __ : __ : __ : __ : __	Unpleasant
Worthwhile	4 : 4 : __ : __ : __ : __ : __	Useless
Spent more time with parent	__ : 3 : 1 : 4 : __ : __ : __	Spent more time with child
Talked a great deal	2 : __ : 1 : 4 : 1 : __ : __	Talked very little
Talked directly about TV program	__ : __ : 1 : 6 : 1 : __ : __	Talked about things related to program
Too time consuming	__ : __ : 1 : 4 : 2 : 1 : __	Not enough time
Required more program materials	1 : 3 : 2 : 2 : __ : __ : __	Required less program materials
Personal	3 : __ : 4 : 1 : __ : __ : __	Businesslike

V. Your Contribution

Very significant	1:1:3:2:__:__:__	Not significant
Easy	2:1:4:__:1:__:__	Difficult
Appreciated	2:3:1:1:__:__:__	Not appreciated
Sufficient time to spend	5:1:1:1:__:__:__	Too time consuming

VI. What You Have Learned

Interesting	6:1:__:1:__:__:__	Dull
Worthwhile	6:1:__:1:__:__:__	Useless
Very much	6:1:__:1:__:__:__	Very little

Appendix J

Socio-Economic Factors of Treatment and Control Groups

	Negro	White	Marital Status					Residence			Community		Number of Moves						No. Children Enrolled	Families Enrolled with	
			Married	Divorced	Separated	Widowed	Single	House	Apt	Oth	Rural Farm	Non-Farm	0	1	2	3	4	5+		1 child	2 children
Package	7	99	100	0	1	4	1	78	21	-	7	4	101	42	31	15	12	2	3	130	83	22
TV [illegible]	2	103	98	1	3	2	1	77	19	-	9	7	98	51	15	14	8	7	10	124	87	17
TV [illegible]	4	98	93	3	1	3	2	63	32	-	7	3	96	40	27	13	10	3	3	115	84	18
Control		22	17		4		1	14	6		1		18	9	5	1	4	1		26	20	1

Socio-Economic Factors

Early Childhood Education

No. Families							Contact				No. Names w/ Other Adults	Average Age	Mother																
Children/Family													Last Grade Completed															Employed
1	2	3	4	5	6	7+	Mother	Grandmother	Babysitter	Other			6 or Under	7	8	9	10	11	12	13	14	15	16	17				
12	40	20	19	9	0	5	95	1	6	3	7	31.0	3	1	9	8	8	9	55	3	4	-	4	1	18			
12	41	27	14	4	4	3	93	9	2	1	13	30.3	2	2	3	7	15	6	45	10	2	-	5	1	17			
6	27	30	15	11	4	3	Not applicable				7	31.4	6	3	6	7	16	13	38	5	1	2	0	1	9			
Not reported							Not applicable					32.2		1	4	1	1	1	9	0	4	0	1		6			

Mother: Last Grade Completed 12	13	14	15	16	17	Employed	Father: Average Age	6 or Under	7	8	9	10	11	12	13	14	15	16	17	18	Deceased	Unknown	Employed	Unemployed
55	3	4	-	4	1	18	34.8	2	3	7	9	7	4	50	5	8	1	3	-	1	2	4	95	6
45	10	2	-	5	1	17	33.9	4	3	11	8	8	5	40	5	5	3	4	1	1	2	5	93	6
38	5	1	2	0	1	9	36.0	9	2	14	5	14	7	32	3	3	1	1	1	-	1	9	88	6
9	0	4	0	1		6	35.9	-	-	1	1	1	2	12	-	-	-	1	-	-	-	4	18	-